

For Advice as to How You Can Keep Your Locomotives on the Track, see pages 619-622

OCT 30 1923

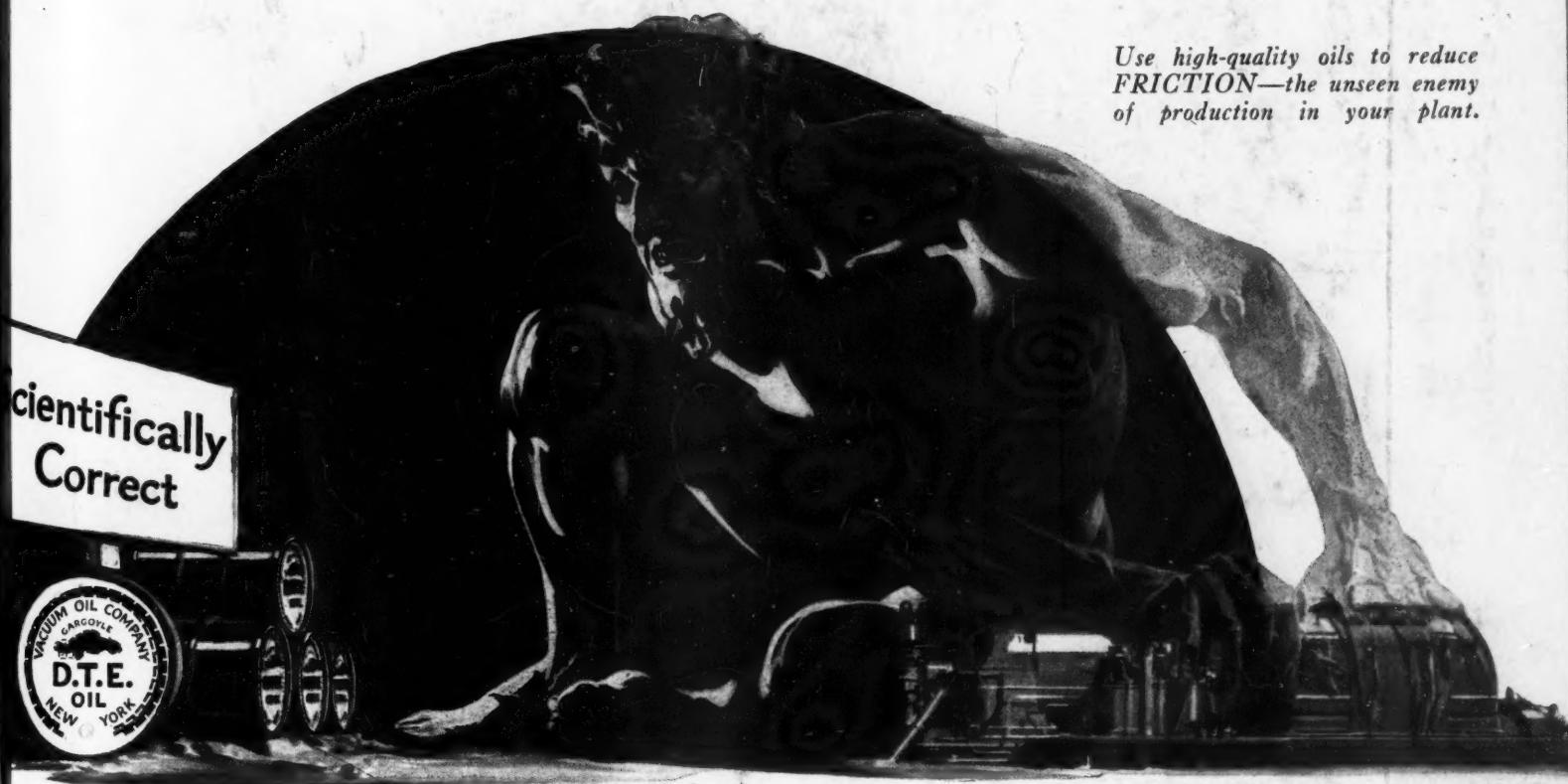
COAL AGE

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COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, Editor

Volume 24

NEW YORK, OCTOBER 25, 1923

Number 17

A Squeeze Can Be Helpful

"CONSOLIDATE!" has been the cry. "Let economic pressure squeeze these excess mines either out of business forever or else into big, well-operated groups. Then the problems of coal will be solved."

Today that economic pressure is hard at work. The weeding-out process in the coal industry is leading to consolidations. In the Middle West right now there are no less than three new consolidations forming and the stronger of the groups formed years ago are carefully choosing the new properties they would like to absorb. In nearly every case the absorbing company is making definite plans to rehabilitate the newly acquired mines so that those operations may have, by the aid of the best equipment and management obtainable, a chance for life.

The encouraging thing about all this is not that the number of mining companies is reduced. Merely eliminating such unfortunates is of no permanent value, for a new crop always is able to spring up from nowhere during each favorable coal season. The real gain to industry lies in the fact that every siege of adversity proves more convincingly than its predecessor that pot-hole methods of mining do not pay in the long run. The mining property that endures is the one that is efficiently equipped and managed.

Today the first act of wise men of coal, upon taking over a failing mine, is to equip and man that mine so that it may have a real chance to stand up under the shocks of a highly competitive industry. Such investing is going on all over the country. As it increases, the measure of engineering and management knowledge in the coal industry increases. Perhaps that is how sound consolidations solve the problems of coal.

Why Not Fix Girard Royalties?

FEDERAL Trade Commission activities are directed against an agreement alleged to have been entered into between a producing coal company and some wholesaling firms to divide profits at a time when Pennsylvania had established a production price. The question arises, why is the producer alone regulated? Why not also fix the royalties on coal, especially that owned by the Girard estate? Is the producing price of coal to be fixed and the royalty price to be immune? Is the agreement to pay a certain percentage of the selling price of coal to the Girard estate also a trade conspiracy? Why not prevent such contracts from being made?

The coal mined by the coal company to be investigated was produced in Pennsylvania and was sold in another state. Is the regulation of price in one state to prevent participation in a profit in another state? Is a coal company compelled to sell coal at a restricted figure when it knows the buyer will sell at an unrestricted figure and pocket a large profit?

If so, where is the justice of such a proceeding? The

payment is alleged to be conditioned on this large profit being made. It is admitted by the commission that if the consumer did not have to pay it the producer was not to receive any part of it. It seems that what this company is said to have done discouraged profiteering by making it less profitable. According to the commission's statement the man who made the price was allowed to make only part of the profit and so had only that part of the margin to act as an incentive to profiteering.

Meanwhile, as S. D. Warriner said the other day, one of the worst profiteers in coal is the City of Philadelphia in the person of the Girard estate.

Firedoors in Coal Mines

SOME of our metal-mine engineers are opposed to reversible fans. They prefer firedoors, operated by hand or electrically. These, Charles A. Mitke says, are foolproof. It will be difficult to get any coal-mining man to assert this of any door. In coal mines generating explosive gas almost any readily closed stopping is a menace. They are necessary evils at best, not to be erected without due need, for the closing of one of them when it should be open or the opening of one of them when it should be closed may result in an explosion.

Even in a mine which does not produce explosive gas naturally or as the result of a mine fire, firedoors are not absolutely foolproof. A mine on fire generates carbon monoxide, and the closing of a door may baffle the air current and hold the monoxide in the workings. If that fire is confined to a mine portal or to a shaft the danger in a mine not normally generating explosive gases is inconsiderable, but if the fire is raging where men are working it may cause the gases to stay and spread in those workings and asphyxiate the workmen.

As it is easier for a single miner to close a door than for an individual to reverse a fan, a door is a dangerous facility, especially when it is not in charge of a responsible man. Still it is not clear that the superintendent would not feel safer if he had a few doors in his mine that could on occasion be unlocked and closed by a man entrusted for that purpose with a key, but he would have to be a reliable man, for the opening or closing of a door is fraught with as many unfortunate possibilities as the reversal of a fan. In fact, how is a fan reversed but by the opening and closing of doors?

At the Argonaut mine, in California, the fire was in the shaft, and firedoors would have kept the gases which were generated in the shaft and circulated by the fan from entering the workings. They would have served their purpose in one way better than a reversed fan, for the air would have been instantaneously stopped, and in another way worse than such a fan because the reversal of the air current would have rid the mine of such gas as the fan had before reversal driven into the mine.

Even in the case of the Argonaut fire the argument

for the fire door is not quite conclusive. However, it is tenable in comparison with a case where the workings are on fire and the shaft is not burning. The ventilation is needed in the mine itself, for it reeks with poisonous gas and is all the time generating more, and it is easy to imagine what might happen in a coal mine with explosive gas and open lights; and, be it remembered, a burning coal mine develops methane whether it is present normally or not. The gas from a coal fire, moreover, contains not only carbon dioxide, carbon monoxide and methane but hydrocarbons of various kinds that are exceedingly harmful to human life. In a shallow shaft and drift workings the right kind of gas mask in the hands of all the men would prove a greater security than either firedoors or reversible fans.

Beautify a Coal Mine? Certainly!

LORADO TAFT, American sculptor, declares there should be art and beauty in every industry—yes, even in coal mining. In coal mining? The average American operator, saturated, so to speak, with the gloom and dust and slime of the "dark industry," achieves that well-known physical impossibility of pricking up his ears. Then he smiles paternally upon Mr. Taft. Has Mr. Taft ever seen a bituminous-coal mine? Is he familiar with the gulches and wastelands in which so many mine towns stand? Has he ever seen the dust and spillage and smoke that are inevitable around a top works? Does he know the attitude of the average miner toward things of beauty, such as green patches of lawn and well-papered and painted houses, which the company may provide? What chance is there for any art or beauty under such conditions?

Well, we are not going to argue that mine operators should erect marvelous figures of the huntress Diana to grace mine-camp crossroads. Nor yet that Italian sunsets in oil should grace the smudgy sheet-iron sides of tipples. There are, however, beautifying touches that can be applied to coal-mine towns and to mines themselves—practical touches. The industry already has a few examples of beauty in mining towns. Trees and parks and flowers in such towns are recognized as exercising a wholesome effect upon labor relations between employer and employee, disturbed only by the influence of outside labor leaders and agitators.

But few indeed are the examples of beauty around the top works of the mine itself. Yet what sound argument can be brought against landscaping the property immediately around the tipple and power plant? A job of grading and sodding, a pleasing layout of shrubbery, a few trees, a cleaning up of discarded sheave wheels and broken cars, a coat of paint—and the place is transformed. City and town electric-light and pumping plants once were as blasting to their neighborhoods as the most slovenly coal-mine top works. A few hundred dollars expended in the "setting" has converted them. The same thing can be done at most mines.

But is there any need for it? Who cares what a coal mine looks like? Many of them are seen only by the miners and their families. The answer is that the effect upon those very people often is worth the expenditure. A Colorado mine superintendent of the hardest-headed, most practical type declares the proper lighting and whitewashing of the shaft bottom makes better workmen out of his miners. They instinctively get the idea the property is well managed, and that something of neatness and efficiency is expected of them in their

own work. A big Western coal company which once invested \$100,000 in architects' fees and extra building costs on a new property frankly to evade the excess-profits tax, found that the appearance of the property improved the performance of the workmen in that mine to such an extent that a permanent clean-up and beautifying program was adopted at all the other mines of the company for the entirely practical results to be attained. So there is something sane and sound in this talk of beautifying industry—even coal mines.

A Little Stone Dust—and Safety

IN COMMON estimation no mine is unsafe unless it has gas and has had an explosion. Coal dust looks as harmless as powder—and it is. It is remarkable with what confidence the man who knew the qualities of neither would view them both. They are both heavily fraught with mischief, but both look harmless enough. Strange also it is how proof and experience leave the average man blind to the dangers of coal dust. He is confident that what happened in Johnson's mine will never happen at his.

When something frightful does happen, when the women gather around the drift mouth or shaft and a hurried call goes over the wire for rescue men, he still declares that no one in reason would have expected anything like that at his mine. Meantime powdered coal, an explosive mixture, lay on the floor and the ribs of the mine. It looked harmless enough until it exploded.

And yet a little powdered shale dust on shelves, on the floor and ribs, or better yet in a stone-dust barrier would have prevented or at least shortened the travel of the blast. Such a simple remedy, that needs only occasional renewal, that is not like water cut off by freezing or the breaking of a pipe, and that does not fail because some underling overlooked some hazardous corner or misjudged the quantity to use; such a simple, readily installed remedy is passed over largely because it is so simple and unimpressive.

Rock dust has the advantage that it can be seen. No superintendent can fail to note if it is present. The use of it does not injure the roof, does not interfere with ventilation, does not involve a heavy charge for piping and pumping or for the maintenance of steam, does not cloud roadways or rot timber. It is useful in the West, where aridity and water scarcity make moistening prohibitively expensive. Yet in how few places is it used! Europe has ordered its application by law and regulation and has availed itself of it. But the United States still lags behind, despite all that has been done to inform the mining public of its value.

Unfortunate is it that the use of it has never been patented and put on the market. Rock dust is too cheap. We can all make it and use it. If it had only been commercialized and advertised, if permission to use it had been sold by traveling men and advocated by a corps of engineer salesmen, it would now be extensively used. As it is, it probably is utilized nowhere but at those mines where disaster has proved in some dire way that the coal dust at that mine is dangerous. Must we have explosions in every mine to make every operator realize that all the bituminous and lignite mines are dangerous and that a few of the semi-anthracite mines might be if the right opportunity were present?

Winter is coming. Surely now is the time to make sure that the mine which has never yet exploded never shall.

Safe Methods for Electric Mine Haulage That Insure Protection to Motorman and Equipment*

**Maximum Grade for Locomotives—When and How to Repair Wheels
—Safety Features of Locomotive Design—Burn-outs Due to Defects
in Series Fields—Advantages of Good Feeders and Return Circuits**

BY J. F. MACWILLIAMS

Electrical Engineer, Pennsylvania Coal & Coke Corporation,
Cresson, Pa.

THE quantity of coal to be hauled per day, weight of the empty car, number of cars per trip, distance the loads have to be transported, track conditions and the grades to be traversed, all combine to govern the weight of the locomotive or the size of the hoist that must be used in mine haulage.

On a grade of 7 per cent a locomotive or loaded car will slide if once started downward; therefore hoists should be used instead of locomotives on grades of 7 per cent or over. This commends itself as a policy, for as a locomotive must haul itself as well as its trip up all grades encountered it becomes extremely inefficient on grades greater than 7 per cent.

As a trip will run readily on a $2\frac{1}{2}$ per cent downgrade, drags should always be provided to prevent runaways in case of a coupling breaking where the grade is $2\frac{1}{2}$ per cent or over. Even if no one is injured, the wrecking of a single trip will prove far more expensive than providing a drag. Thus economy as well as safety will be promoted by its use.

As heavy rails give conditions favorable to traction and also support the load more safely and keep the track in better shape for a longer time, they should be used in preference to light rails.

RADIUS OF CURVES INFLUENCES MANY FACTORS

The wheelbase, diameter of the wheels, speed and other factors of a locomotive should be proportioned to the radius of the curves the locomotive is to run over. For instance, with a curve of 8-ft. radius, the wheelbase should be $20\frac{1}{2}$ in. and the diameter of the wheel should be 18 in. Similarly with a curve of 55 ft. radius, the wheelbase should be 10 ft. and the wheel 33 in. in diameter.

No less a tread than 3 in. should be used on a gathering locomotive running on 16- or 20-lb. rails, as the track cannot be kept in gage unless the tread is at least that specified. With a haulage locomotive, however, a $2\frac{1}{4}$ -in. tread will suffice if the tracks are kept in proper condition.

The minimum clearance of the lowest part of the locomotive from the cross rails should be $3\frac{1}{2}$ in., this allowance being increased to 5 in. at the bumpers; otherwise on a slight rocking of the locomotive or at changes of grades the bumpers will strike the rails and switches.

The weight on the drivers of a locomotive should be carefully balanced. Otherwise the locomotive will tend to climb the rails on curves, the drivers will be likely to slip, pinions and gears may be stripped, the brakes may fail to hold the load and the motors may burn out.

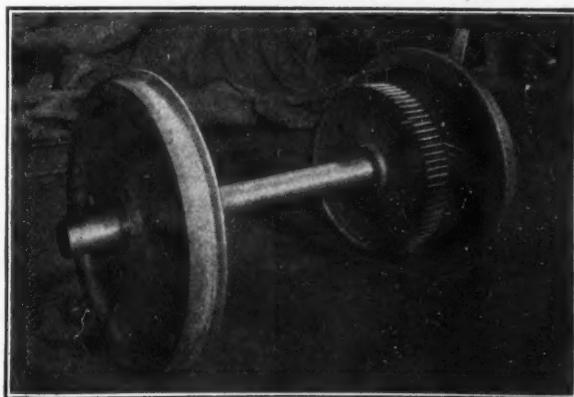
It would appear that the practice of connecting sets

of drivers by sprockets and chain so as to balance the load between the motors could be carried much further than is customary, with beneficial results. The braking effect on a steel wheel is greater and its tendency to slide is less than on a cast-iron wheel. For these reasons it is a safer wheel to operate, but care should be exercised in changing from cast-iron to steel wheels, as the motors are likely to be overloaded by the greater tractive effort after the change is made unless the speed is reduced in some manner.

The cast-iron wheel is cheaper in first cost and will wear less when first installed than the steel or steel-tired wheel, but as soon as the "chill" is worn through it must be scrapped. Due to the hardness of the tread of the chilled cast-iron wheel its adhesion to the rail is less than that of steel wheels. This reduces the drawbar pull as well as the power of the brakes. The steel wheel, whether rolled or cast, or the steel-tired wheel will give 25 per cent more tractive effort than the cast-iron wheel and if properly designed can be turned and trued up successfully several times, thereby offsetting the lower first cost of a wheel made of cast iron.

The most dependable form of brake is one which acts directly on the wheels. Brakes acting on the armature or intermediate shafts may be put out of service by the fracture of a shaft or the stripping of a pinion. For this reason regenerative braking with the motor should be regarded as merely auxiliary. When such braking is provided, the hand brake, which applies pressure directly to the wheels, by no means should be neglected. The brakes should be arranged so that the pressure against all the wheels will be equalized, for by that means the maximum braking effect will be attained.

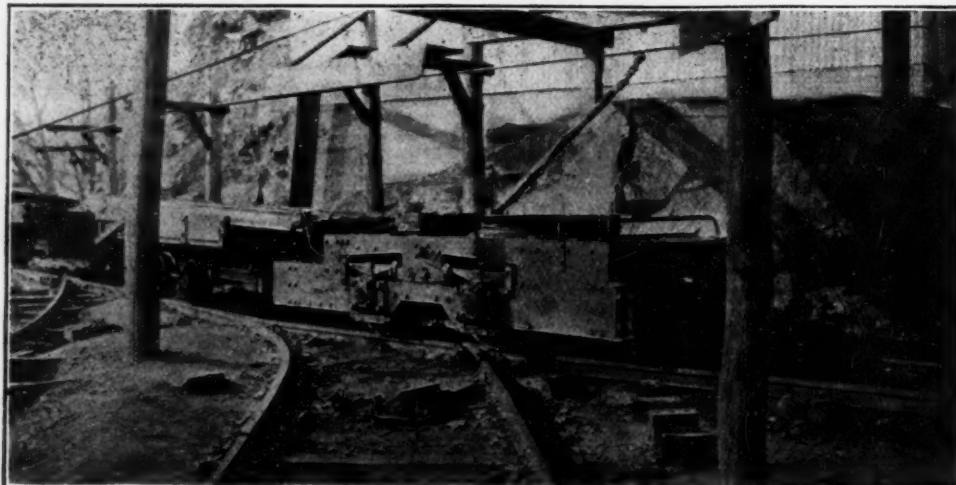
In order to prevent overloading of the motors, which may cause the trip to get out of control when ascend-



WHEELS, AXLE AND GEAR

Care should always be taken to have the wheel tread and flange correctly shaped. Solid gears pressed and keyed to the shaft is becoming standard practice.

*Abstract of paper presented before Mining Section, National Safety Council, at its Buffalo meeting, Oct. 1-5.



Locomotive With Cable Reel

The equipment on the locomotive should be arranged to obtain proper balance. Minimum clearance should not be less than $3\frac{1}{2}$ in. Concentric cable with the negative on the outside renders the cable safer.

ing or descending grades, and because of the high cost of maintenance when the motors are overloaded they should be of such capacity that they can cause the wheels to slip before being overloaded.

One side of the motor should be suspended on springs to prevent shock to gears, pinions, axles and armature shafts. Many cases of high cost of maintenance may be traced to the poor condition of these springs or their elimination at the mine.

The axle linings and the housings of bearings should be carefully inspected for wear, for many armatures as well as many gears and pinions are destroyed from lack of proper adjustment of the gear centers and their alignment.

I prefer a bumper made of a steel channel with wood blocks having two inverted ells or climbing guards near the center. In a collision the wood acts as a cushion and the guards prevent the locomotive from being overridden by the cars. When the bumper is thus constructed the steel channel will bend or spring under severe impacts, whereas if the bumper is a casting it may be broken.

Wheels should be kept in good condition to prevent derailments. Many methods have been tried for overcoming the effects of wear, and the best means for maintaining safe wheels is a consideration closely allied to their efficient operation.

Steel tires, if shrunk on, will prove expensive to maintain unless a good mechanic is on hand to see that the tire is shrunk on the wheel in the correct manner. A tire that can be removed and installed like that on an automobile has been used with success by our company. We have a dummy center on which it can be readily installed for turning whenever the tire becomes worn. We tried for some time to true the wheels by grinding, but the cost was high and the mechanics made much objection to the dust raised during the truing operation. Furthermore, it is difficult to grind the wheels true by this method.

We have reduced the number of shapes and sizes of wheels on our locomotives to conform to certain standards and have so arranged them that in many cases after a wheel has been turned down a number of times it can be used on a locomotive taking a wheel of smaller diameter. Whenever a wheel has worn on the tread so as to have a false flange of $\frac{1}{4}$ in. deep it is sent to the shop for turning.

At the shops standard shapes are kept to which the flange and tread are turned to fit; all wheels are checked before the wheel is mounted on the axle to determine

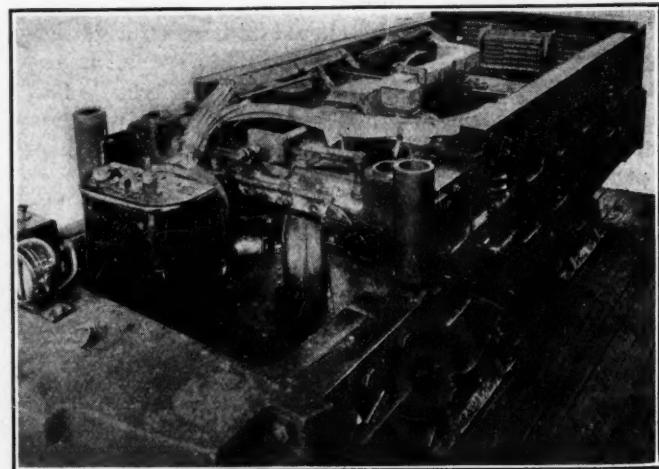
if the bore and tread are at right angles. The wheels of any pair must be turned so that the diameters are within $\frac{1}{8}$ in. of being the same.

The wheels are gaged at the four quarters with a track gage, with ends shaped to the tread and made of $1\frac{1}{2} \times 1\frac{1}{2}$ -in. flat steel, the purpose being to determine if the axle and wheels are true. The wheels are checked again at the mines with a similar gage to determine whether they have been damaged in shipping. We have made no attempt to build up the whole tread of a worn or damaged wheel by welding for fear that doing so would warp the wheel or set up heat strains. However, flat spots in the tread not over 2 in. in length are sometimes restored by welding, the wheel being turned true after this operation.

We have not been successful in using self-grinding brake shoes, as every locomotive wheel would need a shoe suited to the deformity produced by wear and the wheel would have to be carefully watched. The shoe would have to be removed when it had done its work or it would wear down the tread excessively.

All the wheels should be turned at the same time, for if one pair has a thin flange and the other is new, derailments are likely to occur. In that event the locomotive will not ride parallel to the track. Consequently, when new wheels are installed a complete new set should be provided.

I believe it is safe to state that 20 per cent of the series fields in locomotive motors that have been oper-



STORAGE-BATTERY LOCOMOTIVE

Note the large protecting fuse and safety fuse box. The lip or climbing guard on the bumper to prevent the cars climbing on the locomotive can be faintly discerned.

ated over three years are defective, and it is good practice to test the fields whenever an armature is changed, otherwise the armature may burn out because an armature running in a defective field will tend to rotate faster than normal and if in parallel with another motor will carry an excessive load. It is for this reason principally that I believe it to be bad practice to provide only one circuit breaker or one fuse for a locomotive. Contrary to the general practice each individual motor should have its own protection.

If a thorough inspection were made of all locomotives it would be found that in many of them the wire is too small. In consequence time is lost on the road, material is destroyed, and the motorman unnecessarily exposed to danger. These defects could be avoided if more consideration were given to the size of the wire and its proper installation.

In most cases 4/0 trolley wire is as small as should be used in the trolley circuit and in some cases we are about to try 6/0 wire so as to obtain more power and give the trolley wheel a better contact. In but very few roadways should the hangers be placed over 25 ft. apart, and in many places they should be set even closer,



SPLIT MOTOR CASING

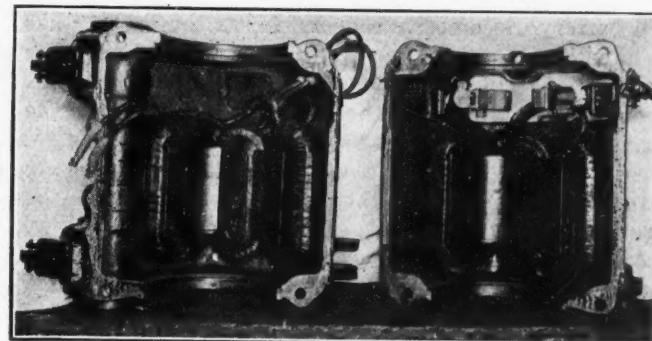
Many burn-outs and troubles with armatures are due to bad series field coils. A short-circuited coil will still pass current, but the reduced field strength causes the armature to become overloaded by taking more current for a given load.

as the price of a hanger and the cost of its installation is easily lost in the damage to pole heads, wheels, poles, etc. Furthermore, when the wheel leaves the trolley wire the motorman is exposed to many dangers due to flashes and the possibility of the trolley head catching something and being pulled off or becoming damaged.

Seldom are enough hangers installed on curves, and the trouble resulting from the incorrect alignment of the wire is so frequent that the motorman regards it as a condition altogether to be anticipated. The feed to the trolley wire from the feeder generally is mechanical and of insufficient capacity. Soldered feed ears with soldered lugs instead of setscrews and a soldered tap to the feeder would give better results.

It is remarkable to me that no one wishes to try out in the mines the Edison three-wire system, using the rail as a neutral. If the locomotive is in perfect condition, safety and economy are still lacking.

In many instances it will be found that a feeder having a cross-section of as much as a million circular mills has been installed, with 2/0 or 4/0 bonds on the rail and no return conductor. If the rail is of ample capacity it is more economical to bond the rail to its capacity than to go to the expense of a return conductor, as the labor cost of installing a small bond will be nearly as great as that for installing a large bond, and the material cost of the large bond will be much less than the cost of the small bond plus the return



MAIN AXLE BEARINGS

All bearings should be kept at a reasonably close fit to prevent excessive lash between the gear and pinion teeth. Hard metal end plates on the journal box prevent excessive end play of the driving axle.

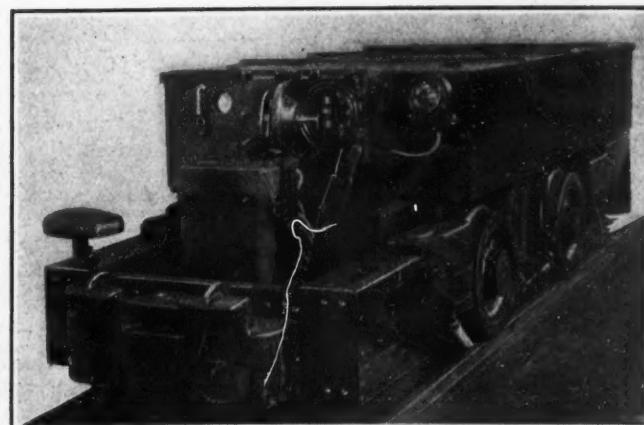
conductor. I prefer the welded bond, for while the initial results obtained with the compressed type of bond are as good as those of the welded type, the welded bond unquestionably lasts longer.

Wherever possible feed ears should be of the soldered type, for after a clamp feed ear has been in service for a year its value is doubtful. To give the necessary strength the suspension ear should be long and thin rather than short and thick, so that the trolley wheel may pass over it smoothly and without vicious sparking.

With an inadequate feeder or return system the locomotives will work inefficiently, the cost of maintenance will be high and as the headlights will fluctuate, an irregular illumination of the track will make the haulage service dangerous. Furthermore, with bad trolley wire and hangers the vicious sparking that will inevitably occur will partly blind the motorman and distract his attention.

For main haulage hardly anything will compete with the trolley locomotive. If the excessive ventilation required by a gasoline locomotive can be provided for without undue cost that form of haulage can be used, but where such ventilation is costly or hard to obtain the gasoline locomotive cannot compete with the electric.

For gathering service, the storage-battery locomotive probably is the safest but it has the disadvantage that during the day's work it is constantly losing power. The cable-reel locomotive probably is the type most likely to cause accidents, for at the room neck the operative must make connections either with the trolley wire or with both the trolley wire and the rail. The dragging cable and cable reel also need care if accidents are to be avoided. We have found the duplex (trolley



FAN VENTILATED LOCOMOTIVE

The motors should be of sufficient capacity to spin the wheels before becoming overloaded. Overheating can be prevented in many cases by proper ventilation of the motors.

and battery) locomotive economical, as the battery has to handle only one or two cars in a room and the time lost in connecting a reel cable is obviated. The duplex locomotive is safer than the cable-reel type because the danger in the coupling of the cable is eliminated. We get more coal per locomotive with the duplex gathering locomotive than with either of the other types, the straight-battery machine gathering least coal of any.

All our cable reels are grounded through the frame of the locomotive and when using concentric cable some of the dangers may be avoided by making the outside copper always of negative or ground polarity.

The more nearly the proper amount of sand used the safer and more economical is the operation. The ideal quantity of sand to use would be such as would give

the rail a coating as thin as that placed on sand paper. A handful of sand will offer as much resistance as a 2-per cent adverse grade, and a large quantity will obstruct the trip after the locomotive has passed. It also will tend to reduce the power received by the locomotive and is likely to insulate it from the rail, making it dangerous for persons to touch the locomotive frame.

In conclusion I may say that we have had at our mines only one minor accident due to locomotives in three years and only three minor accidents due to electricity in that same period. In the past we had many derailments some of which were due to the springing of axles in the unloading of wheels. Since we have put our safety rules in force we have had no locomotive derailments for a whole year.

Open Cut to Head Off a Six-Acre Fire

AN UNDERGROUND fire in the Pittsburgh seam of coal near Charleroi, Pa., adjoining the workings of the Youghiogheny & Ohio Coal Co., of Cleveland, Ohio, bids fair to be extinguished after nearly a year of effort. All known means were tried, without success, to extinguish the fire, which covers about six acres.

Finally decision was made to cut off the fire by means of an open trench. This cut is approximately 1,000 ft. long. It has an average depth of 45 ft. at the ends, within 50 ft. of the outcrop, and the overburden runs up to 65 ft. at the center of the cut. The excavation when completed will have an average width of 65 ft. on the top of the cut and 25 to 30 ft. at the top of the coal. The material at the center of the cut lies in regular strata, approximately 15 ft. being yellow clay, 20 ft. hard shale, 12 ft. hard sandstone, 12 ft. hard slate, 3 ft. very hard sandstone and 3 ft. hard slate, the last being over the coal.

The material was drilled partly with jackhammers and partly with well drills but the greater part of the work was with the latter, 40-per cent dynamite being used. Cuts were made in low lifts, that being necessary largely because of cave-ins to old workings, for the excavation had to be made in ground undermined long ago, which accordingly afforded an uncertain support to the steam shovel. In fact only a shovel mounted on continuous treads could be used. Effective drilling

was difficult, because many holes went through to old workings, the location of which could not be determined in advance. Such holes were, of course, of no value for blasting purposes.

The contract for this work is being performed by the F. E. Welsh Contracting Co., Inc., of Cleveland, Ohio, and has been in progress since Feb. 10, in which time about 70 per cent of the total yardage of approximately 80,000 cu.yd. has been handled. The equipment consists of an Osgood one-yard continuous-tread revolving steam shovel, two four-car trains of 3-yd. cars and two 12-ton dinkies of 36-in. gage. Work is carried on in two shifts of nine hours each, and the material removed runs as high as 800 cu.yd. per day, the shovel often handling material that is too large to pass through the dipper. Large rocks are either chained to the dipper and loaded on the car or are cast back of the shovel to be jack-hammered into sizes that the dipper can pass.

The upper 12 ft. of clay was cast over the sides, and the remainder hauled to waste at either end of the cut by the two dinky trains. The other 30 per cent of material is solid rock and hard slate, and progress is slow and difficult because of the cave-ins and by reason of the mine gas and gaseous fumes leaking through from the fire. Some of the material being loaded is too hot to handle with bare hands.

To date the work has been performed without accident, but the hazard is greater as excavation comes closer to the coal.



Digging Trench Across Fire

A cut 65 ft. deep is being excavated across the path of a mine fire despite escaping fumes and poisonous mine gases and in rock some of which is so hot that it burns the hands. The cut is about 1,000 ft. long, mostly in solid rock. The caterpillar mounting gives the shovel stability despite the uncertain footing.

Construction and Care of Distribution Transformers*

Selecting the Best Transformer for the Work—Consideration of Iron and Copper Losses—Building the Transformer—Careful Testing—Recommendations as to Proper Care

BY L. G. MASON
Engineer with Westinghouse Electric & Manufacturing Co.

THE use of distribution transformers in the mining field has an aspect somewhat different from their use in the distribution system of a central station supplying electric energy to light and power customers. In the case of a central station the entire income is derived from the sale of electrical energy to the power and lighting customers, and this revenue from the sale of electrical energy is directly contingent on the efficient operation of the generating and distribution system and the continuity of its power supply.

Where the revenue is derived from the sale of the product, as in a mine, the electrical machinery becomes merely an incident in the production, however essential it may be to the safe or continuous operation of the mining property. Its importance, however, is apparent from the serious effects a breakdown might cause in hazard to human life or loss of output from the mine through interference with regular production.

MINE OPERATIONS REQUIRE BEST EQUIPMENT

This brings up an important point. Has the mining industry always appreciated that only the highest quality of electrical apparatus is entitled to consideration for mining service? I believe that this is more generally true today than ever before, but looking back several years you can undoubtedly recall the time when you first decided to electrify certain parts of your system—competitive prices were obtained and in some cases the lowest bidder received the business irrespective of the better quality of higher-priced equipment. The actual comparison of the stability of the apparatus was not always appreciated and this undoubtedly was partly due to incomplete data on the characteristics of the apparatus. This to a certain extent prevented the selection of the most suitable material.

Today, however, conditions in this regard are vastly improved. Manufacturers have envisaged the opportunities for mining electrification, special equipment is developed for its service, and sales offices and branch service stations are testimony of the importance that this field of application of electricity is assuming.

This question of service may be considered from two standpoints: First, service delivered by the transformer when in operation, which is contingent on the quality of the apparatus; and second, service rendered by the manufacturer in assisting in maintaining service at all times through engineering help, through prompt shipment and through prompt handling of repair jobs.

Under the first classification we may consider the electrical performance of the transformer. Actual losses due to transformer operation may not show up on the books as a direct loss, but obviously a mine cannot avoid paying for the internal losses in its transmission and distribution system, so that a transformer

with better electrical performance possesses advantages over one with inferior performance.

Therefore price always should be secondary to quality, for the initial difference in investment will be recovered many times over in improved service.

In the consideration of the characteristics of a transformer essential to reasonable economy of operation, a relatively low iron loss is necessary as the iron loss is constant throughout the period the transformer is connected to the line, while the copper loss is a feature which is dependent on the load conditions. Low iron loss should not, however, be carried to the extreme with a consequent high copper loss, as the copper loss varies as the square of the load, and is, therefore, added to the peak load of the line. A high copper loss would necessitate a larger and more costly generating equipment; a kilowatt-hour of copper loss is, therefore, more expensive than a kilowatt-hour of iron loss. The average ratio of losses for a distribution transformer is approximately $2\frac{1}{2}$ watts of copper loss to one watt of iron loss.

The performance of a distribution transformer should not only take in the values of iron loss and copper loss but also should include the regulation at different power factors. This question of regulation becomes of great importance because it often is necessary to install a transformer at a point where the line drop becomes

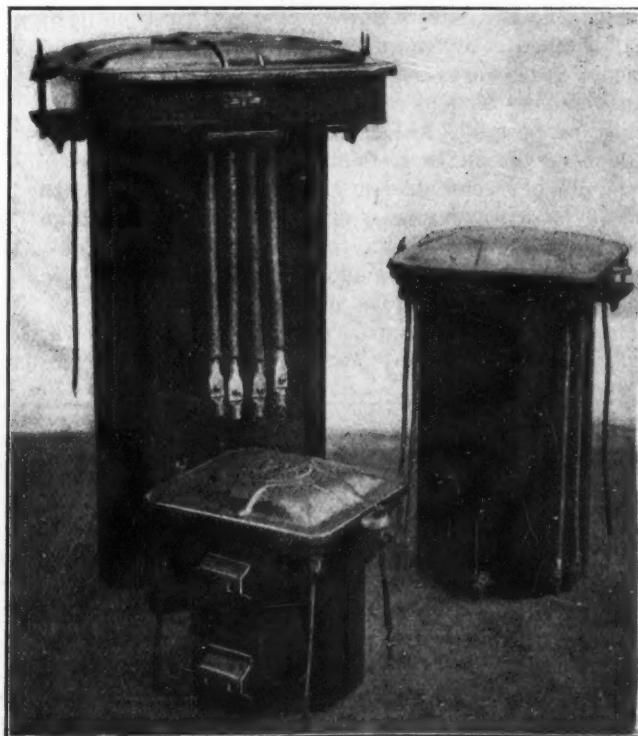


FIG. 1—THREE DISTRIBUTING TRANSFORMERS

The relative size of 5, 15 and 50 kva. transformers is apparent here. Note the drain plug at the bottom of the 15 kva. transformer for draining oil for test purposes.

*Presented before West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers, Huntington, W. Va., Oct. 19 and 20, 1923.

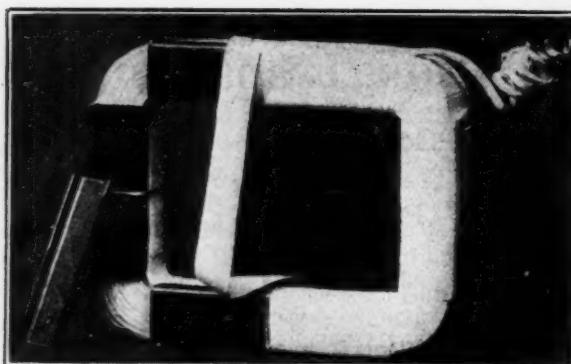


FIG. 2—HIGH-VOLTAGE TRANSFORMER COIL

Heavy micarta channel pieces are taped in position to insulate the winding from adjacent coils and iron.

very great. Under these circumstances, if the drop in the transformer is added to the drop in the line, the voltage may be reduced to a point where it causes unsatisfactory operation of motors and dim illumination of incandescent lamps.

Possibly this factor of regulation is not always given due consideration, but when it is understood that poor regulation means a large drop in voltage under full-load conditions it will be appreciated that just when normal voltage is required, such as during a heavy lighting load or during a heavy motor load, only low voltages are available, resulting, as stated, in the lights burning dim or the motors losing power and heating up.

So far we have dealt with certain major requirements that are essential in a transformer if it is to render good service while in operation; we will now review some of the features in the construction of a line of modern transformers that assure the requisite protection against breakdowns in service.

The construction of distribution transformers presents a far more difficult achievement than is commonly thought to be the case. The difficulty arises not in the actual transformation of a voltage from one value to another but is due to the ever-present desire to approximate a transformation with 100 per cent efficiency. The achievement of 100 per cent efficiency is as impossible as a perpetual-motion machine, but it is possible to reach very close to the 100-per-cent mark; in fact, transformers have been built having 99 per cent efficiency. Compare this with the efficiency of a steam engine or any other electrical apparatus and you will at once realize what care and pains have to be taken by the manufacturers in building this apparently simple piece of apparatus.

High efficiency of transformation is the goal toward which all manufacturers are striving, but this word

efficiency should not be taken only in its electrical sense. An efficient transformer must be one that is absolutely safe, reliable, and at the same time economical to operate. Keeping these three points in mind, the various details of transformer construction will show the very careful attention that is paid to even minor points.

A transformer comprises four essential parts: The iron core, the high- and low-voltage windings, the cooling medium (usually oil in distribution transformers), and the tank.

The method of assembling the coils and core will vary for different manufacturers and for different transformers, but, practically speaking, there are only two general forms of construction—the one being the core type and the other the shell type. In the core type the coils surround the iron, whereas in the shell type the iron forms a shell around the coils.

The same general methods of construction are used in both types and the same care is taken to render each type as efficient and economical as possible. In

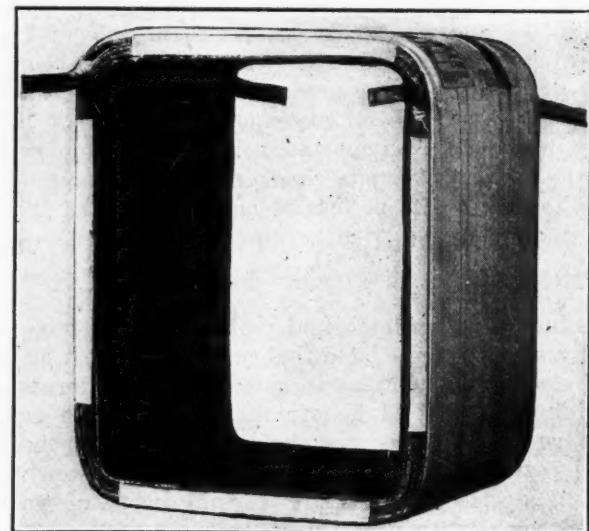


FIG. 3—LOW-VOLTAGE TRANSFORMER COIL

This winding is wound on a mica-micarta barrier shaped to conform with the type laminations used.

order to obtain the greatest efficiency it has been found that no one type or form of construction is best suited for all sizes of transformers. For this reason the larger manufacturers use different forms of construction for different capacity ratings and voltage ratings. Distribution transformers may be subdivided into four types: The distributed-shell, rectangular-core, cruciform-core and simple-shell.

The distributed-shell has been found by our company

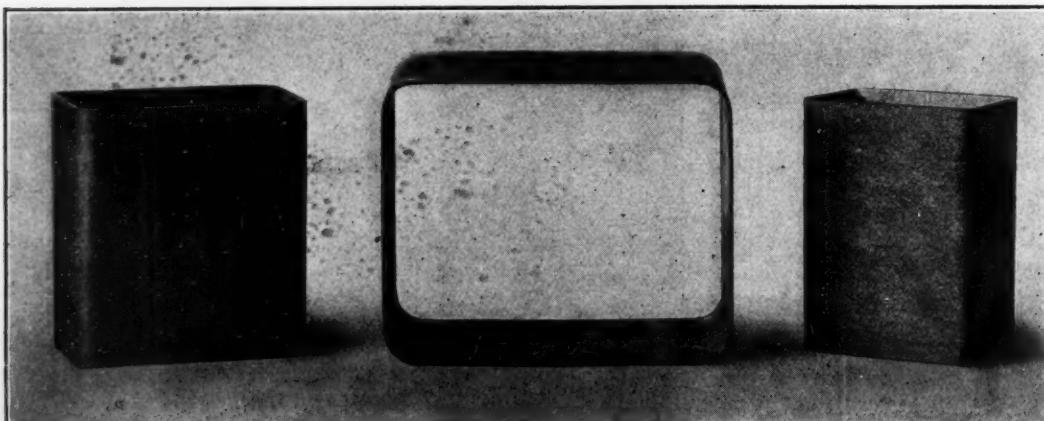


FIG. 4

Micarta Forms

These forms are shaped by machine while warm so as not to crack at the corners.

to be ideal for small-capacity, low-voltage transformers, and for a given weight of material it is possible to obtain lower losses and lower exciting currents than are obtainable by using a core-type construction. This form of construction, however, has its limitations, and because of the lack of cooling ducts and the difficulty in insulating it is not used on capacities larger than 50 kva. or on voltages over 4,600.

The rectangular-core type design is used on higher voltage and larger kva. ratings. On the very high voltage distribution transformers, such as 33,000, 44,000 and 66,000 volts, we use a cruciform core or circular coil design, and for the large kva. capacity distribution transformers, such as 150- and 200-kva., 25-cycle units, the simple-shell construction offers a convenient solution to obtain the necessary cooling, insulation and mechanical strength in as small a space as possible.

The same fundamental methods of assembly are included in all of the above transformers. The coils are wound separately on forms or mounds. The silicon steel laminations are later built in one at a time by hand.

In order to give a better picture of the care and attention paid in building distribution transformers, we will follow through step by step the various operations taken in building a 10-kv. steel-clad unit.

The windings of this type of transformer are built

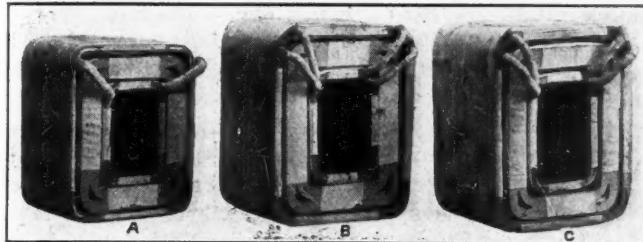


FIG. 5—TRANSFORMER COILS COMPLETE

The coils consist of the high- and low-voltage windings ready for the test.

up of a number of separately wound high- and low-voltage coils; micamicarta barriers form the insulation between the high- and low-voltage windings. These barriers are formed by winding alternate layers of micarta paper coated with a shellac bond and built up with mica sheets on a steel mandrel under heat and pressure.

After winding, the tubes, which are circular in shape, are cut the proper lengths and then while hot are formed by means of expansion molds. Before being formed the tubes are heated to a temperature sufficiently high to soften the binder. This allows the flakes of mica to slide over one another at the corners and prevents cracking. Ideal insulating barriers are obtained by this method.

The low-voltage coils are wound separately on these micamicarta barriers. Micarta collars or fullerboard washers are placed at the edges of the coils to provide insulation and mechanical strength.

After winding, the coils are inspected separately and assembled into groups. Two low-voltage coils and one set of high-voltage coils comprise a complete winding. In the assembled group the high-voltage winding is placed between an inner and an outer low-voltage coil. This arrangement, while intended primarily to reduce the reactance and to improve the regulation of the transformer, also provides separation between the high-

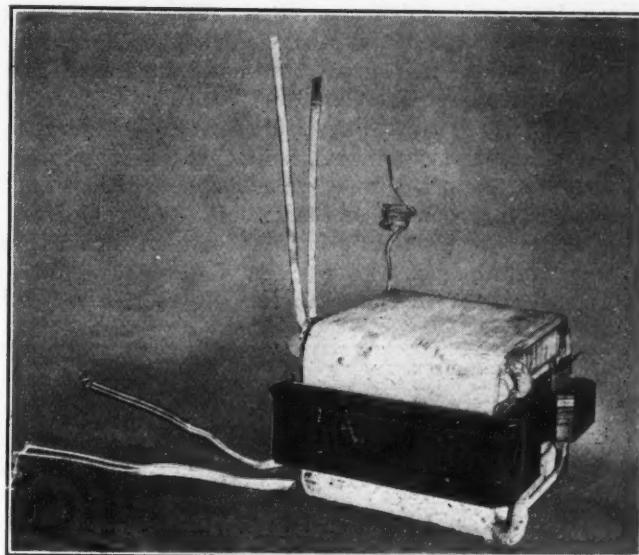


FIG. 6—MAGNETIC CIRCUIT PARTLY ASSEMBLED
The silicon steel laminations are built into the coils and stacked by hand.

voltage winding and the magnetic circuit, and to a certain extent insulates the high-voltage winding from the ground.

The next step is a careful inspection and test of the windings to locate only defects or wrong connections.

The magnetic circuit, which is made up of thin sheets of non-aging silicon steel of a very high grade, is then built into the coil assembly, thus completing the core of this type transformer. The silicon steel used has a low hysteresis loss and conforms to the specifications of research engineers. Samples from each heat are given careful tests and only the highest grade of steel is selected for use in distribution transformers. The laminations are carefully annealed and given a coat of baked-on enamel to reduce eddy-current losses.

The core is now ready for a preliminary test, which is given all Westinghouse distribution transformers before impregnation. These preliminary tests are for the purpose of weeding out any transformers having losses exceeding their guarantees. Those transformers that pass the preliminary tests are then impregnated by the vacuum process, which consists of thoroughly drying out the transformers in ovens and then placing them in large vacuum tanks into which the impregnating compound is forced under high pressure after all the air has been removed from the tank.

The only step remaining is the final assembly of the transformer core into the tank and the final tests. The steel clad tanks used by the Westinghouse company comprise a tank built up by welding together a number of separate stampings. These parts are stamped out by large punches from blank sheets of Arnco rust-resisting iron. The tanks, after being welded together, are then subjected to a sand blasting process. This is done to render the surface more similar to a cast-iron surface and thus better able to hold the coats of paint. It is a well-known fact that a smooth sheet metal surface does not make as good a foundation for paint as a rougher surface, and in order to eliminate any possibility of the paint chipping off the outside of the cases the sandblasting process is used.

The next and final step in the building of a transformer is the testing process. This involves a very careful insulation test, also a test for ratio, polarity,

iron loss and exciting current. Those transformers that pass the limits allowed for these tests are then carefully crated and shipped to the ultimate user. Every transformer receives the same careful tests and the test results are always available for future reference.

The transformer, once it leaves the manufacturer, is often subject to a number of adverse conditions caused by lack of proper care and attention.

There is a wide difference of opinion among users as to the proper care to give distribution transformers. In general, distribution transformers receive very little



FIG. 7—FINISHED COIL UNIT

The winding and laminations are here shown before being mounted in the tank.

attention at the present time, but this is not an ideal situation and is caused chiefly by lack of man power on the part of the users and because the reliability of the modern transformers makes this possible without disastrous consequences. Periodic inspection, cleaning and testing would well repay its expense.

From a manufacturing point of view it is well known that a distribution transformer will have a much longer life when properly taken care of than when neglected. Detailed records are not always kept on transformers; therefore, there often is no way of determining the actual service various transformers render. The decisions as to the service various makes of transformers render, often are based merely on breakdowns, divided by the number of transformers on their lines. The results thus obtained do not give a correct picture of the conditions of operation, nor would they be entirely fair to all manufacturers.

In making the following recommendations as to the care of distribution transformers, we have taken into consideration the operating facilities of the average transformer user:

Transformers, when received from the manufacturers, should be stored in a dry room having an even temperature, and preferably the tanks should be filled

with oil. This latter precaution will to a large extent prevent moisture damaging the windings. A number of transformer manufacturers at the present time are impregnating their coils and iron as a unit. This tends to render the transformers more impervious to the absorption of moisture, as the impregnating compound effectually seals the windings, laminations and joints.

Before placing a transformer in operation, manufacturers' specifications recommend the drying out of the unit, but from an operating standpoint this drying-out process seldom is adhered to on distribution transformers, 13,000 volts and below, 100 kva. and less, as the users invariably feel that the factors of safety are sufficiently large so that even should there be a slight amount of moisture present, the insulation would be strong enough to withstand the abnormal conditions. The manufacturers, of course, disagree on this procedure, as they feel that every possible step should be taken to enable the transformer to render safe, reliable and economical service, and with moisture present in the windings safety and reliability are uncertain.

DRYING TRANSFORMER TO REDUCE HAZARDS

In those cases where a user desires to dry out a certain transformer, this may be accomplished in either of one or two ways, or by a combination of both. The usual method is to short-circuit one of the windings and supply sufficient voltage on the other winding to heat the transformer to a temperature slightly above the surrounding air temperature, but never above 80 deg. C. Under this heating process the transformers should be connected without oil in the tank, thus allowing the moisture to evaporate readily. The heating process should be continued from 8 to 24 hours, depending upon the site of the transformer. The second method is by the application of external heat, such as by building a fire in close proximity to the transformer and allowing the warm air to blow against the unit. Care should be taken to see that no sparks catch on the windings, which might char the insulation. The quickest way to dry out a transformer is by a combination of the two methods.

A few of the larger central stations at present are giving considerable thought to the care and maintenance of their distribution transformers already in operation, and one company has gone so far as to procure a truck on which is placed a De Laval oil purifying outfit, a complete insulation testing outfit, and a cleaning and repairing outfit. It is the intention of the company to visit every one of its transformers at least once every three to five years. The transformers in their turn will be removed from operation, cleaned and dried out, the oil will be purified and dried, the tanks will be painted, and any other necessary repairs will be made, after which the transformers will again be connected up for further operation.

This scheme seems to be a cheap method of keeping distribution transformers in continuous operation with few breakdowns and presents a far better method than that used heretofore in waiting until a transformer burns out and then bringing it back to a repair shop for repairs. It is, of course, impossible to foretell the savings that will result by the use of such a repair truck, but it is self-evident that the transformers receiving this care will be better able to withstand service conditions, and, furthermore, this truck service will enable the company to replace with larger units any

banks of transformers that may seem to be overloaded.

In so far as smaller companies are concerned, a truck of this nature would not be an economical proposition, but the underlying principles embodied in the use of this truck would apply, and it is recommended that every distribution transformer receive periodic inspection. Even a superficial inspection as to moisture and general conditions would be better than nothing. This can be effected very readily by removing the drain plug at the bottom of the transformer and drawing off any water that may be present. Any rusty spots on the tanks should be repainted and broken bushings should be replaced.

In case there is water present in the tanks immediate steps should be taken to have the oil drained off and replaced with dry oil, and in case the transformers in question have a primary voltage of above 6,600, then the transformers themselves should be dried out. The reason we make this distinction in voltage is that transformers 6,600 volts and below are suitable for star connection on 1.7 times the normal winding voltage, and, therefore, their factor of insulation safety is high. In fact, a number of companies have found that if tests are made, these lower voltage transformers do not show any marked tendency for breaking down even when a

certain amount of moisture is present in the windings.

A new development just brought out by several manufacturers consists of a temperature-indicating device to be installed in the tank of distribution transformers. These temperature indicators will give the average consumer a cheap and convenient method for determining the load conditions on his transformer. Some indicators have an advantage in that their use will enable the operator to pick out an underloaded as well as an overloaded transformer. In the former case the transformer should be replaced with a smaller size unit, saving considerable in transformer losses, whereas in the latter event the transformer should be replaced with a larger size unit, thus eliminating the possible chance of a breakdown with consequent delays and expense.

As time goes on there will be improvements that will render distribution transformers even more efficient and more trustworthy than at present, but in the meantime these suggestions will more than repay the owner of the transformer: The transformer coils and oil should be kept dry and clean, and the tanks should be kept free from rust. With these simple precautions and under normal load conditions distribution transformers should render efficient service for twenty-five to fifty years without replacing.

Cutting Cast Iron by Oxyacetylene Flame

AT ONE of the interesting Open Forum Sessions presided over by J. C. Wilson at the American Mining Congress, H. B. Rice, of the Oxfeld Acetylene Co., delivered an address on oxyacetylene welding which was followed by a discussion in which several questions which had presented themselves to A. J. Hendricks were answered by the author of the paper.

Mr. Hendricks referred to Mr. Rice's statement that only in the last two years had it been possible to cut cast iron with the acetylene torch. He wanted to know if the flame really cut it or melted it down; was it cut like steel as by a saw or was it cut in an uneven line? Mr. Rice replied that the cut was not clean like that made in steel and said that a little more acetylene was used in the cutting of cast iron than in severing steel by the same method. The cutting cannot be kept as well under control as can the cutting of steel, as the metal does not flow so readily. However, the operative can make within 50 per cent as good a cut with cast iron as with steel, but it takes a man with experience in the work to do as well as that. There is slag in gray iron and in consequence there is a tendency to clog. About 50 per cent more gas is used with cast iron than with steel.

The deepest cut he had ever seen made was about 14 in. The cast iron took more time to preheat. A welding torch is needed to remove the surface slag before working that surface with the tool. The hardening on the face of steel is only about $\frac{1}{8}$ in., but with cast iron it is deeper, and, consequently, whereas steel that has been cut with the oxyacetylene torch can readily be worked or welded, cast iron is too hard for working without previous use of the welding torch.

J. H. Edwards said that every mine should have welding equipment, but the first equipment to get was the oxyacetylene for cutting, but every mine should have electric welding equipment because of its greater economy and because with it the strains due to heating were not so severe.

W. P. Bovard, of the Ohio Brass Co., said that in some states it was unlawful to introduce gas into the mines, making it impossible to weld pipe underground. He added that light-weight electric welders can be used on large welds by progressive work. The carbon arc in the cutting of steel, said Mr. Bovard, melts the steel just as the oxyacetylene flame in the cutting of cast iron causes that metal to melt.

Canadian Institute Discusses Coal

At the fifth annual convention of the Southern Saskatchewan branch of the Canadian Mining and Metallurgical Institute, held at Estevan, Sask., on Oct. 3 and 4, coal mining formed the principal topic. Dr. Edgar Stanfield, of the research department of Alberta University, presented a paper showing the importance of a standard method of analyzing coal. Dr. J. A. Allen, of the University of Alberta, stressed the necessity of extensive geological research by the prairie provinces and outlined the plans for the provincial geological survey of the coal basins in Alberta with which the federal government was co-operating.

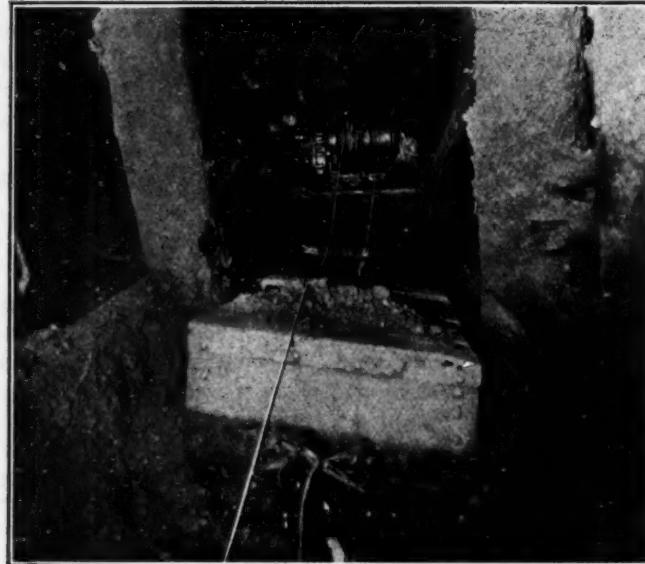
First aid to the injured was the subject dealt with by J. A. Kenny, who stated that the total number of accidents reported to the Workman's Compensation Board of Alberta for 1922 was 7,358 and gave a description of the training of classes for first aid to the injured. John Gallaway, mine manager, and J. A. H. Church, mining engineer, of Edmonton, related their experiences in underground fires in coal mines. On the second day the delegates made an automobile trip to Columbus, N. D., and visited the lignite fields there as the guests of the operators. In the evening a banquet was held at Estevan at which the principal speaker was Premier Dunning, of Saskatchewan, who spoke in favor of continuing the lignite briquetting experiments. The results so far obtained would, he considered, warrant the carrying on of the work to a stage where it would be definitely established whether lignite can be briquetted on a commercial basis or otherwise.

IN VIEW OF THE SITUATION in the Ruhr it is difficult to understand how the expression "French leave" ever happened to be invented.—*Detroit News*.

New Equipment

Scraper Hoist Operated on Compressed Air

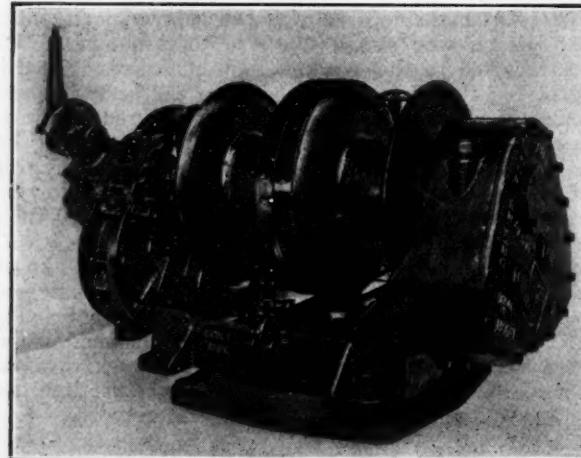
A SCRAPER hoist known as Model 300 Turbo Waughoist has recently been developed by the Denver Rock Drill Manufacturing Co., of Denver, Colo. This hoist operates on compressed air, which is always available in the mines wherever compressed-air rock drills are being used. The hoist is light in weight, well balanced and readily portable. It is very powerful for its size, developing a high starting torque, and is simple



WAUGHIST IN SERVICE IN THE MINES

As a means of speeding up production scrapers are becoming very popular in many mines. They not only reduce the labor cost but aid greatly in increasing production.

and easy to operate. Safety devices prevent accidental operation and lubrication is practically automatic. High air pressures are not needed for successful operation of the hoist. The recommended air pressure is 50 lb. and with this pressure the average horsepower developed is 10. The maximum horsepower rating is 13.5. At a rope speed of 295 ft. per minute the hoist will develop a rope pull of 1,600 lb. At 118 ft. per minute



MODEL 300 TURBO WAUGHIST

Compactness, ease of control and safety make possible the more general application of labor-saving devices to assist the miner. This little hoist operates by air.

it will develop a rope pull amounting to 2,200 lb.

This hoist weighs 495 lb. The transmission gears are placed at the end of the hoist opposite the air motor, thereby giving a good distribution of weight. The hoist, being well balanced, can be readily moved from one location to another without danger of damage.

The drum diameter is 6 $\frac{1}{2}$ in. and gives the hoist the powerful starting torque so important in mining work. This more than compensates for the wear on the ropes that might occur from this small diameter.

The hoist engine is in reality an air turbine consisting of two steel rotors revolving within an airtight compartment. These rotors are carefully balanced and revolve freely, eliminating the vibration so common in other types of hoists. The construction permits no dead center; therefore the hoist will start in any position.

New Electric Solder Pot

A SOLDER pot with automatic heat control has been added to the line of labor-saving devices manufactured by J. D. Wallace & Co., 1401-17 West Jackson Boulevard, Chicago, Ill. This device greatly simplifies the problem of heating babbitt, white metal, wax and other materials which are slow conductors of heat. These materials must be kept at a uniform temperature if satisfactory results are to be obtained, and this new solder pot is designed to automatically maintain the temperature of the material in the pot at 600 deg. F.

The control of the heat is an adaptation of the principle used in the steam gage. A volatile substance which is very sensitive to heat actuates a Bourden tube which makes and breaks the electric circuit, thus controlling the temperature of the contents of the pot. The pot weighs only 13 lb. and will accommodate 15 lb. of solder, which can be heated in from 20 to 25 minutes.

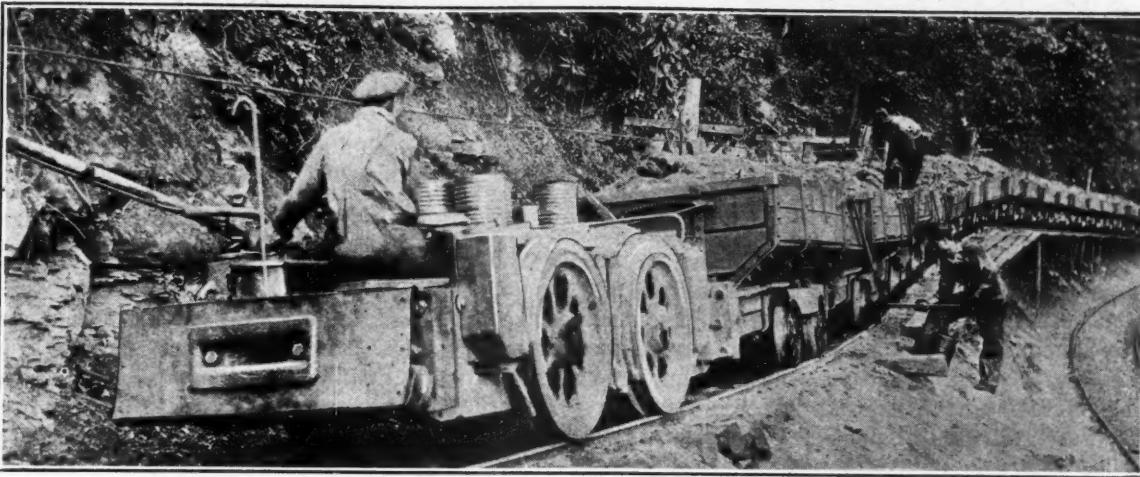


ELECTRIC SOLDER POT WITH AUTOMATIC HEAT CONTROL

The proper temperature of the material being melted in the pot is maintained automatically; no need to spend half the time to do a job watching the melt heat up.

The pot operates on either 110-volt or 220-volt alternating or direct current. The heating element is a 900-watt heater, which is so designed as to apply heat to all parts of the sides and bottom of the container.

This equipment is a great saver of material and time. By properly maintaining the correct temperature, oxidation of the material in the pot is prevented.



Preparing to Push a Long Trip of Mine Cars*

Safety Council's Mining Section Discusses Industry's Most Burning Question: Safety in Transportation

Large Increase in Membership and in Funds—Three Large Safety Conferences Promoted—Spirited Discussion of Value of Carbon Dioxide in Extinguishing Fire at Bitner Mine

RECORD attendance marked the Twelfth Annual Safety Congress of the National Safety Council held at the Statler Hotel, Buffalo, N. Y., Oct. 15. This was hardly surprising in view of the fact that the membership has increased from 3,060 to 3,321 during the fiscal year commencing July 31, 1922, an advance of 10.8 per cent. The number registering, however, showed an even greater advance, though this year the executive board required a \$2 registration fee from all outside the immediate vicinity of the convention city.

The receipts from the active membership totaled \$164,369.06; additional service, \$574.50; sales of pamphlets, bulletins and miscellaneous literature, \$16,015.14; the calendars, \$63,521.94 (gross revenue); the *National Safety News*, \$16,875.01, and interest earned \$289.23. The total revenue from all sources was over a quarter of a million dollars, or to be exact \$261,644.88.

Just before the last fiscal year ended the Council provided for the setting aside of a reserve of 7 per cent of all membership funds and that reserve is now \$12,629.18. In addition to this the surplus increased during 1922-1923 from \$34,819.78 to \$46,721.75, an addition of \$11,901.97. Thus the Council is \$25,000 to the good as the result of the year's financial operations.

In this substantial increase in surplus nothing can be ascribed to the publication of its *National Safety News*. It cost the Council \$11,502.67 more than it was able to earn. However, in estimating its balance no credit has been given to the dues of members allocated to that purpose, the members being assumed to receive it as a free service of the Council.

*Motorman is about to push a long train of cars on to a tipple. Part of these are on an S vertical curve such as would favor derailment. The speed of pushing here, however, is so slow that if a wreck is caused it will not be severe. Boy is oiling the cars while opportunity presents.

At the enthusiastic general session it was stated that the Council had added four new trade sections, two field secretaries, three new safety films and ten new community organizations. A. W. Whitney, speaking to the subject "The Inner Meaning of the Safety Movement, Particularly in Its Application to the Problem of Education," said that an accident etymologically and practically was the falling of something across the path of the normal, that our purpose was to build up the normal condition of life, which the very word "accident" signified was the condition being interfered with. Hence those who would teach safety should not preach a negative but actively urge the choice of the normal, the preference for the good adventure as opposed to that which was inherently bad.

Human nature had built up in the ages a spirit by which danger was circumvented and avoided almost without conscious resistance, but the development of machinery had created dangers against which there were no inherited defenses either mental or physical. The rule of the survival of the fittest might be written as the survival of the safe. In past ages those who were fitted physically and mentally to be safe survived. A new era with new dangers would have to find new resistances to meet new conditions.

L. A. De Blois, in his address on "The Year's Experience with Local Councils," incidentally struck a similar note. Power, said he, had extended from the factories and mines to the streets. It was now entering the homes. To some extent the factories and mines had met the dangers which power had created. Our industrial establishments, in proportion to the degree with which they utilized power, had been termed slaughter houses and shambles. Power, having moved to the streets as typified by automobiles, railroads and street cars had

turned these into shambles, danger increasing daily instead of decreasing, as in industry, and directing attention to these menaces instead of those of industrial establishments. Could it be that with the development of the home as a power user would come the time when the accident rate within the walls of dwellings would be our greatest concern?

That haulage accidents are in large degree preventable was the keynote of the meeting of the mining section of the National Safety Council commencing Tuesday, Oct. 2, and occupying each morning till Thursday, Oct. 4. The work and standards of the Pennsylvania Coal & Coke Corp. were described by G. F. MacWilliams, electrical engineer of the company, who was able to announce that, "we have had at our mines only one minor accident due to locomotives in three years" and "since we have put our rules in force we have had no locomotive derailments for a whole year."

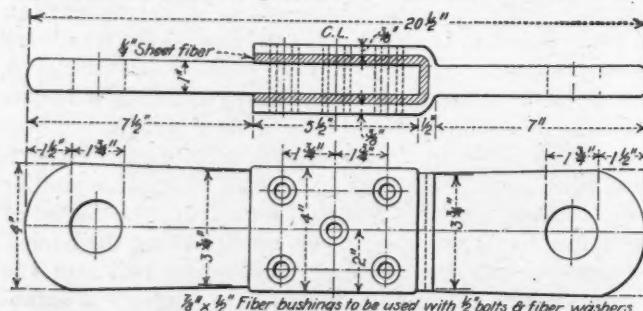
To measure what this declaration means it was necessary to call on Mr. MacWilliams for information as to the size of the company which had thus so greatly reduced accidents. He told those present that the Pennsylvania Coal & Coke Corp. operated thirty-nine mines and 205 locomotives and that in many places coal was hauled as many as five miles from the face to the tipple, the average haul in one mine being 3.8 miles.

In concluding his paper Mr. MacWilliams remarked that "too little attention is paid to fuses on all mine machinery; copper wire, pieces of iron, etc., often replacing fuses. Circuit breakers are jumped or blocked, with the result that the equipment is overheated, insulation is roostered and in consequence in case of short-circuits or other troubles neither machine nor operator has any protection.

"All kinds of mine cars are used, yet, as far as I can learn, little consideration has been given to reducing the friction in plain bearings by properly proportioning them to the speed of the wheels, except possibly in the case of the hollow axle.

"Most couplings are of primitive type and a source of danger. The car in general is seldom designed so that it will haul the largest quantity of coal with the least possible dead weight, due regard having been given to the kind of mine in which it is to be used."

Mr. MacWilliams advocated using a gage to determine at the mine as also at the shop whether the wheels were at right angles to the axle, careful balancing of the weight on the drivers of a locomotive, the turning down of wheels as soon as the false flange is $\frac{1}{4}$ in. deep and the turning of any two wheels of a pair till they are within $\frac{1}{16}$ in. of the same diameter. The care manifested is justified by the results, which are altogether beyond reasonable expectation. Mr. MacWilliams said



INSULATED DRAWBAR COUPLING

This coupling is used at the mines of the Pennsylvania Coal & Coke Corporation for preventing current from running back from the locomotive to the mine cars. Fiber serves as the insulating medium.

that finding 16-lb. rail too light for rooms, they are laying the track in all new rooms with 25-lb. steel.

In a discussion of means whereby current can be prevented from traveling back through the cars, Mr. MacWilliams advocated the use of fiber as the insulating medium. He said that wood tended to split and that fiber gave better results. He offered to provide an illustration of the coupling for use in the transactions. This line drawing appears herewith.

FORMING CONFERENCES, MOST FEASIBLE ACTIVITY

The meetings opened with the Presidential address and the report of C. Lorimer Colburn, whose work since the middle of the year has not been financed in any way by the Council. He is now specifically assigned to the work of forming chapters of the Joseph A. Holmes Safety Association and while he can and is requested by the Bureau of Mines to co-operate with the National Safety Council the work must not be allowed to interfere with his other duties. Consequently he is not able to give that work any more than incidental attention.

In the first year Mr. Colburn visited 78 mines and in the second year, believing that better work could be accomplished by forming conferences which would meet to promote safety, he visited only 49 mines. Mr. Colburn declared that four separate inspections were or could be accorded at any mine—the mine's own inspectors, the state mine inspectors, the insurance inspectors and those of the Bureau of Mines, for the Bureau will inspect a mine if desired. In consequence the single safety engineer of the Council could hardly hope to compete with all these agencies for inspection. Forming conferences, therefore, seemed a more rapid way of promoting safety work.

Byron D. Shove then read his paper "Safety in Underground Transportation—Metal Mines," which clearly reveals how different the problems are in such mines where the grades are made to suit haulage and not to accord with the irregular floor of a coal bed. In metal mines the difficulties are largely connected with overhanging chutes and the trolley wire. At the Gogebic mines of the United States Steel Corporation automatic gongs of the gravity type are placed on all electric locomotives. The gong sounds only when the locomotive is in motion. Mr. Shove remarks, "We feel that any such warning should be automatic so as to remove the personal equation which is always present in hand-operated warning devices. Headlights are placed on both ends of the locomotive and are protected by meshed screen guards placed in front of the open face. A red light is carried on the rear end of the train. After many tests we are using a railroad flagman's lantern manufactured by Adams & Westlake Co., Chicago, Ill. It is similar to a railroad switch light, but much smaller and lighter. It has two red bull's-eyes which are in line with each other. The lamp in the lantern burns signal oil.

"In years past we have had serious accidents to motormen whose feet, hanging outside the locomotive pit, were crushed between the locomotive and the cars or timber trucks it was moving. We have, therefore, made it imperative that the motorman shall, when the locomotive is in motion, keep his feet inside the locomotive pit. As the locomotive goes out to the shaft, the trolley passes over a spring contact switch. This throws on red lights in the drifts and crosscuts [cross and main

entries] from which other locomotives are pulling. When the locomotive returns from the shaft the contact spring switch is automatically thrown by the trolley again but in the opposite direction. This extinguishes the red lights and turns on the green ones, showing that the block is clear.

ONE WHEEL TIGHT AND THE OTHER LOOSE

"Where a drift [cross-entry] breaks off a crosscut [main entry] the radius of the curve usually is 30 ft. The axles of the mine cars are $2\frac{1}{2}$ in. in diameter and of cold-rolled polished steel. They are equipped with 16-in. semi-steel wheels, one of which is pressed on to the axle, the other being loose. This loose wheel takes up the slippage when the car is going around a curve. The couplings are of cast steel and the links and pins of wrought iron. The gage of the cars is 24 inches."

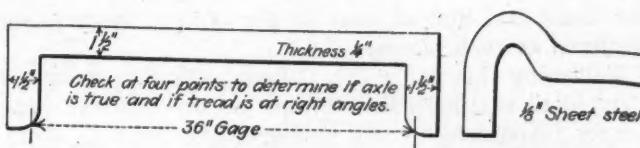
These quotations from Mr. Shove's paper are not arranged exactly in the order in which he placed them, but they are grouped in such a way as to furnish the coal-mining engineer with the information likely to interest him. The loose and the tight wheel, though made more necessary by the sharp curves, would have its advantage when turning into the rooms of a coal mine where the car has a larger gage and the wheels, therefore, more slippage. The lights switched on and off by the trolley are interesting, but they would have to be used in a different manner in a coal mine because usually the distance to the shaft or tipple is greater than on a metal-mine level. The "crosscuts" from the seam to the landing of the level usually are quite short except at considerable depths.

Joseph Reed, safety engineer, Consolidation Coal Co., said that the automatic couplers would become uncoupled at track joints if they were of the Junior type, the pins not being long enough to prevent that action. Another engineer said that he had been obliged to weld shoulders on the coupling, above and below, so as to give the required depth. Later discussion called attention to the difficulty with automatic couplings where cars were pulled over a sharp knuckle, as at the tipple.

In discussing A. F. Brosky's paper "Safety in Underground Transportation in Coal Mines—Tracks," Mr. Reed said that he had found that in a mine where 50- or 60-lb. rail was used and where naturally false flanges wore in the wheels to accord with such rail, the locomotive had little tractive effort on any relatively short or newly installed length of 70-lb. rail because the wheels rested on a surface only about $\frac{1}{4}$ in. wide.

B. F. Tillson said he had used 70- to 80-lb. rail in slope shafts and had obtained a section with extra deep webs so that the rail was practically a girder. The rail rested on piers 10 ft. apart. The skip is hauled at the rate of 4,000 ft. per minute. Mr. MacWilliams said that no little trouble was caused in mines by not using the "suspended joint," which probably is universal practice in railroad work. Such a joint makes travel much easier.

At the second session R. H. Seip read A. F. Hoskin's article entitled "Safety in Underground Transportation in the Coal Mines of Illinois with Special Reference to Derailments." Mr. Hoskin's recommendation that cars be given a longer wheelbase so as to make them more stable did not meet with Mr. Reed's approval. He said that if the wheelbase were made longer, the radius of



WHEEL AND TIRE GAGES USED BY MR. MACWILLIAMS
The Pennsylvania Coal and Coke Corporation is confident that by keeping the axle true and the tread at right angles derailments can be avoided.

the curves into the crosscuts that are driven through the pillars for the recovery of pillar coal would have to be increased and that would make the work of "pillaring" more dangerous. We need flexibility in haulage as much as stability, for with sharp turns the roof is more easily sustained.

It would not improve matters if we saved lives in haulage, only to lose more or even as many in pillar drawing. R. Dawson Hall explained that in Illinois pillars were not drawn and in other sections the pillar was worked entirely off the end, the car standing on the straight room track and the coal being shoveled from a distance to and into the car making a car of longer wheelbase than that now being used permissible. B. F. Tillson said that perhaps scraper loading would fill the requirement and that it might be necessary to make a radical change of that sort to permit a longer wheelbase and afford the needed safety.

LEAVING THE WORK TO THE LOCOMOTIVE BRAKE

The article by G. M. Gillette, general manager, and Joseph W. Reed, safety director, of the Consolidation Coal Co., entitled "Safety in Underground Transportation at Coal Mines—Mine Cars," not only brought up the much discussed question of brakes and no brakes but added the question, "Should neither brakes nor sprags be used on cars?" The opinion of Frank Haas was quoted to the effect that with modern haulage the locomotive was sufficiently fitted with brakes to control a car effectively. Mr. Reed said that it often was necessary for men to move cars by hand as, for instance, before firing a shot. A shot fired when the car was near the face might severely shatter the end. It might be necessary to move a car at the end of the shift for fear that it might be buried under a fall during the night or on an idle day following.

A sprag might serve especially with a block to hold the car, but where brakes have once taken the place of sprags it is hard to find good spraggers, for spragging is one of the decadent fine arts. The relative safety of the end and side brake was discussed, and Mr. Reed said they had only one mine with end brakes. It might not be significant, but the men preferred them and the accidents were fewer. He agreed with Mr. Hall that they seemed the more dangerous even though the snapper barely went between the cars at all in putting on the brake.

One of the coal men present said that he used the end brake, the lever of which was pulled toward the brakeman, and he found it safer than the side brake. The men at his mine were not allowed to push the brake over. Mr. Illsley, of the Bureau of Mines, brought up the question of clean track, but it was suggested that as most of the spragging or braking was done at certain specific places and as the operation causes collisions between the braked portion of the trip and the free-running part it was almost impossible to keep such places clear of fallen coal even with daily cleaning.

Mr. Reed said that at least 75 per cent of the braking occurred at such places.

Following this paper Mr. Gillette's "Safety Practices Pamphlet" entitled "Maintaining Safety Interest" was briefly introduced by Mr. Colburn, and John T. Ryan, president of the Mine Safety Appliances Co., showed how with a tube of Hopcalite a mouse can be protected from the carbon monoxide in the air with which it is furnished. By passing the air with its 1 per cent of carbon monoxide the mouse was soon overcome and being supplied with an atmosphere of 95 per cent oxygen and 5 per cent carbon dioxide was soon revived. Experiments also were made into the Bureau of Mines method of matching with a scale of permanent colors the product of a mixture of blood saturated at different carbon-monoxide concentrations, diluted with water and mixed with pyrogallic and tannic acids.

DEADENING A MINE FIRE WITH CARBON DIOXIDE

By far the most interesting of the sessions was the third and last, at which Charles L. Jones, of the Mellon Institute of Industrial Research, Pittsburgh, Pa., gave his paper on "Fighting Mine Fires by Carbon Dioxide in Liquid Form." It was expected that from this would arise the question as to the availability of carbon dioxide for fighting metal-mine fires, but that possibility was not for a moment brought up. William G. Duncan, of Pennsylvania State College, was present and he took a diametrically opposite view of the situation to that taken by Mr. Jones.

The facts from the contributions of the two opposing parties appear to be as follows: The Bitner mine fire was fought at first by the use of water, without any great progress being made. The season had been extremely dry and water was quite scarce, and all that could be obtained was what was not being used by the coke ovens. This was entirely insufficient for the necessities of the occasion. The official in charge at the mine was Patrick Mullen, a man of recognized ability and long experience, but neither is of much avail without a plentiful supply of water, as any city fireman will tell you.

SHALLOW COVER GREATLY AIDED WATER SCARCITY

Now, Bitner mine had a shallow cover, and many falls had occurred which had broken the surface in such a degree as to permit the entrance of air. In consequence the dry or sealing method did not offer any promising solution. The situation was indeed desperate, and there are many mines which under like circumstances have been allowed to burn for years, in the hope—a vain one in all instances—that the fire would burn itself out. The company wanted to operate the Bitner mine and feared the extension of the fire to others of its valuable properties. In consequence it was decided to use carbon dioxide to save the mine, and the fire speedily decreased in severity, so much so, in fact, that the company decided to reopen the mine.

This was done with much caution. Hot coals were found, and some places where fire was still found to be active were re-sealed so that time would cause the fire to go out. These later were opened and the fire extinguished with water. At the places where the water had reached to the roof the fire was completely extinguished. Many other places which the water had not reached had traces of extinguished fire but no fire or hot coals present. Some places probably had never been the seat of fire, and some others were still so hot that unsealing caused them to blaze.

Every evidence points to the fact that the use of carbon dioxide had a most valuable retarding and extinguishing effect. It doubtless prevented vacua being formed during the cooling process. It is at such times that carbon dioxide has its utmost value, for if a neutral gas is not supplied the fire will find a way to replenish its vacuum and will draw air through walls, ribs and roof rocks, obtaining enough not only to fill up the vacuum but to stimulate combustion. In fact the carbon dioxide is more needed with a cooling than an active fire, for the fiercely burning coal will make its own extinctive atmosphere and its own outward pressures that will preclude the infiltration of air.

After the cessation of the use of carbon dioxide, the fire may cool further and again obtain air. The pressures may not indicate much suction, for if the cooling is slow the air may come in slowly, but in sufficient quantity, nevertheless, to rekindle the fire. As the fire recovers, the suction becomes less, for there is then no reduction in volume. Consequently the administration of carbon dioxide should be continued until unsealing, enough being used to prevent the formation of even a partial vacuum.

It appears that some heated coal still remained in the mine after its reopening. In the time that has elapsed since March 19, 1923 it is not strange that a fire had developed, so that even now, nine men are employed steadily playing water on it with six lines of hose, with about thirty cleaning up slate which fell during the period when the fire was still burning, the work being necessary to restore the haulage roads and put the mine in condition for further operation.

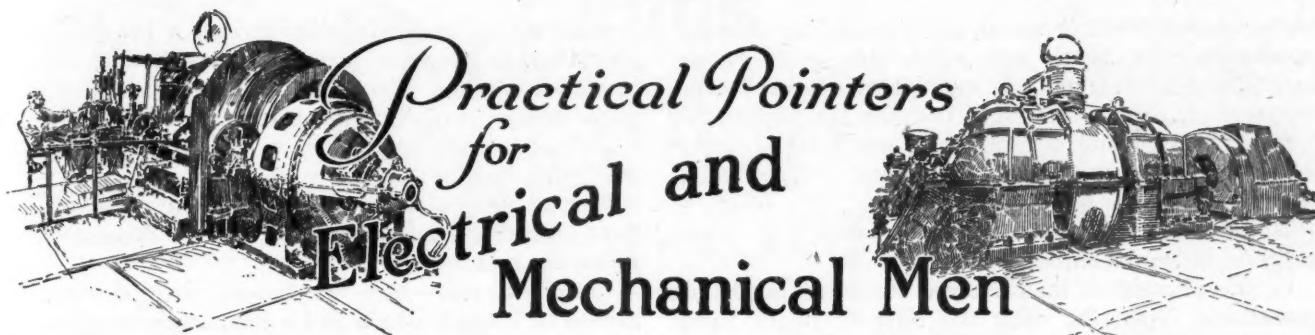
QUESTIONS HOW MUCH AREA FIRE HAD COVERED

Mr. Duncan declared that there were two original fires and that they were separated by a length of 1,200 ft. of unburned coal. He held that the reason why no fire was found in much of the so-called fire area was because it had never been on fire. Mr. Jones said that the fire may have started at several places, but that the main haulageway showed signs of fire throughout the distance between these points.

In the course of his remarks Mr. Jones said that in no place where the air analysis showed continuously for a month less than 5 per cent of oxygen was any sign of fire or hot coals found after unsealing. Mr. Tillson remarked his surprise at this in view of the fact that he had fed a producer working on carbonaceous shale with an atmosphere having only 5 per cent of oxygen and nevertheless maintained rapid combustion. Mr. Jones said that Mr. Tillson was feeding the producer with a good current of air, even though that air was lacking in oxygen. Other conditions also were different.

Mr. Colburn earlier in this session, which commenced an hour before the scheduled time and terminated an hour later than provided, read extensively from the Safety Practices Pamphlet, "Maintaining Safety Interest." A report was made on the specific services of the Mining Section based on inquiries made by the chairman. The articles on "Maintaining Safety Interest" from George C. Hewitt, supervisor of industrial insurance and hospital service, Pacific Coast Coal Co., Seattle, Wash.; Thomas Cowperthwaite and Albert Tallon will be printed in the minutes and duly considered in the final draft of the Safe Practices Pamphlet.

The names of the newly elected officers of the section and of the Council will be found in the Oct. 11 issue of *Coal Age*, page 566.



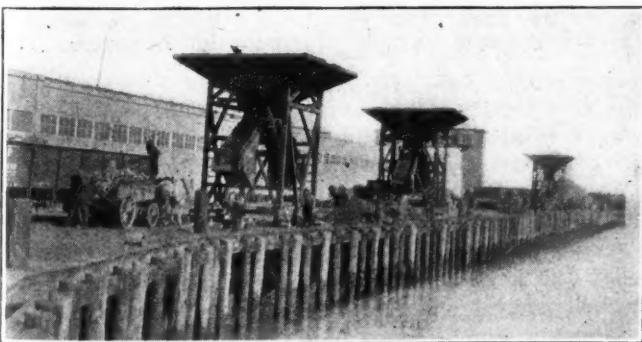
Practical Pointers for Electrical and Mechanical Men

Coal-Handling Towers Made Portable By Use of Wooden Rollers

BECAUSE of the large shipments of coal and coke coming into San Francisco by steamer, the State Harbor Board has just finished placing six large wooden rollers under each coal tower, so that the towers can be easily and quickly moved to points on the dock convenient to the ship's hatch.

The coal is unloaded from the hold of the steamer into these towers, which is then loaded into trucks or wagons by means of chutes, each tower having two chutes. The towers will soon be equipped with a third chute, by means of which coal or coke can be loaded directly from the tower to a car, as there is a railroad spur paralleling the towers.

Before placing the rollers under the towers it re-



LARGE COAL TOWERS MOVED WITH WOODEN ROLLERS

By means of the rollers shown at the base of the towers it is possible to locate any tower in a new position in a short time. These rollers and plates can be turned so as to move the tower in any desired direction.

quired a crew of six men, with two hydraulic jacks and rollers and a motor truck, to move one of the towers. With this equipment it required about two hours to move a tower only a few feet on the dock. Now by means of the rollers placed under the towers any tower may be moved to any new position in five minutes by the ship's tackle.

Each of the rollers is 8 in. in diameter and 3 ft. 6 in.

long, with a 10-in. groove in the center. There is an iron bar bearing for each roller which slides on an iron-shod timber, which in turn is bolted to the timbers supporting the tower. A large iron washer placed between two timbers and properly greased, gives a swivel motion, enabling the rollers to be turned at any angle, permitting the towers to be moved in any desired direction along the dock.

CHARLES W. GEIGER

Brushes for Mine Locomotives

SELECTING the proper grade of carbon brush for an electric machine always is a difficult problem. To obtain the right brush requires a thorough knowledge of the various grades of carbon, backed up by long experience in service. Even with this information the problem is still difficult because loads, qualities of materials in the commutators, vibration, etc., vary greatly even with the same type of machine.

When making a selection of a brush the following fundamentals in connection with operating conditions should be considered: Commutation, life of commutator, life of brushes, frequency of inspection, current density.

The above factors will vary more or less with the design of the motor, the design of the brushholder, the correct spacing of the brushes, vibration, condition of the equipment, condition of the armature bearing, condition of the commutator surface, brush tension, load, speed, service conditions, etc.

Since all of these factors must be taken into consideration, the best and most reliable results are obtained by making tests of recommended grades in service under actual operating conditions. Brush manufacturers generally are willing to assist the operator in making service tests. The following general information regarding brushes will help the operating man more intelligently to select brushes for service tests.

Carbon is a non-metallic element found in both crystalline (made of crystals) and amorphous (non-crystalline or irregular shaped) form. Natural graphite is carbon in a crystalline form, and is mined in many localities. Amorphous or non-crystalline carbon may be obtained in the form of coke or lamp black. Artificial graphite is obtained by heating amorphous or non-crystalline carbon, such as coke, in an electric furnace to change its structure to a crystalline state.

By the use of the above materials the following general classes of brushes are made:

- (1) Carbon brushes—made of crushed coke and binder.
- (2) Graphitized brushes—made of carbon and then electrographitized.
- (3) Graphite brushes—natural graphite and binder.
- (4) Metal graphite brushes—natural graphite with metal powder and binder.

With the modern commutating-pole locomotive motor

having commutators undercut, and considering costs per locomotive mile, brush end wear, side wear, breakage, life, commutation, life and maintenance of commutator, etc., these classes of brushes are best suited for locomotive motor service as follows: (1) Graphitized brushes—best all-around results. (2) Carbon brushes—next best all-around results. (3) Graphite brushes—very special and limited uses. (4) Metal graphite brushes—not used at all.

In the process of manufacture the most important operations, depending upon the class of brush being manufactured, are as follows:

- (1) Crushing, carbonizing (if it is done) and cooling.
- (2) Milling, mixing, cooling and remilling.
- (3) Moulding and packing in the furnace.
- (4) Gas baking.
- (5) Electric baking or graphitizing.

The two most common general methods of manufacture are:

Extruded or Squirted.—Where the material in the form of pulp is forced through a metal die under pressure and then cut off to the desired length and baked with a high temperature to carbonize the bond and permanently set the material. This method is used in making the cheaper grades of carbons, which do not have much strength to resist breaking and chipping in service.

Moulded and Machined.—Where the material is moulded into blocks under heavy pressure and baked. The brushes are cut from these blocks and machined to exact size. This method is used in making the high-grade brushes and gives a brush of uniform texture and strength that is best suited for locomotive work.

In the manufacture of various grades of carbon brushes best suited to meet the requirements of operating conditions, the following characteristics of the brush must be considered: Contact drop, hardness, resistance, coefficient of friction, apparent density, abrasiveness, heat conducting, conductivity, toughness.

Length.—For use in the more modern brushholders, the brush should be not over 2 in. long; that is, when new they should not extend above the top of the brush box for the following reasons:

(1) If longer, they are subjected to a greater side pressure due to the action of the contact tip, which increases the side wear, tends to bind the brush in the box and reduces the direct pressure on the surface of the commutator.

(2) If longer, they are discarded because of excessive side wear before the added length can be used up in end wear.

(3) Approximately the same mileage can be secured from the shorter carbon; and hence, since the brushes are bought on a cubic-inch basis, the first cost is less.

The width is not so important; they can have as much as $\frac{1}{2}$ in. clearance in the box without causing any trouble in service.

Thickness is very important, as the initial clearance between brush and brush box should be approximately from 0.006 to 0.008-in. If it is much less the brush will tend to stick in the box and bind, and if greater, it will soon rattle in the box, wearing away the side; it also will tend to chip and break, thus reducing the life of the brush.

When pigtails were used on brushes, it was considered necessary to copper-plate the brush to provide a good electrical contact for the shunt connection. With the

present design of brushholder having a heavy braided copper shunt from contact tip to brush box, shunted brushes have been discontinued, so the copper plating is unnecessary; in fact, it is objectionable on the higher grades of brushes as it tends to peel off in service and bind the brush in the box.

For locomotive work, pigtails or shunts on brushes have been practically done away with on account of the following reasons:

(1) First cost—they were used with the cheaper grades of brushes which had a comparatively short life, making renewal of brushes at frequent intervals necessary.

(2) Inspection—the pit men could not be depended upon to maintain shunts during inspection.

(3) Not very reliable—the design was such that shunts became loose, disconnected and were not reliable.

With these conditions greatly improved by the use of a higher grade of brushes with longer life, requiring less frequent inspection, and by improved methods of fastening pigtails to brushes some advantages can be obtained by their use. In certain specific cases, especially for very heavy current densities, they have been adopted with a saving in maintenance. Foreign practice tends to the more extensive use of shunts than is customary in this country.

Determining Power Transmitted Through Leather Belt Drives

WE HAVE a large fan at one of our mines which has not yet been called upon to develop its ultimate capacity. From time to time we have increased its output to meet our air requirements, but now I believe we have reached the safety limit on the belt. This belt is a double leather one and I would like to know how much power we can safely transmit through it.

SUBSCRIBER.

There are several important factors which determine the amount of power transmitted by a belt. These may be resolved to total effective pull and speed of the belt. The effective pull is the difference between the tension on the tight and loose sides of the belt.

Expressed as a formula, this equation becomes—

$$\text{Horsepower} = \frac{L \times S}{33,000}$$

L = Total effective pull in pounds.

S = Speed of belt in feet per minute.

This effective pull usually is expressed as working tension per inch of belt width and depends upon the grade of material, thickness, and also upon the speed of pulley due to the centrifugal force which tends to throw the belt away from the pulley surface.

Allowing ample factors of safety and taking into account the effect of centrifugal force, average values for effective tension per inch of width for single leather belts are shown in the following table:

Belt Speed Feet Per Minute	Working Tension Pounds Per Inch Of Width
1,000	72
2,000	68
3,000	65
4,000	60
5,000	53
6,000	45

The above values are for 180 deg. arc of contact. For double belts multiply the figures in the table by 1.6 and for triple belts multiply by 2.



Problems of Operating Men

Edited by
James T. Beard



Rules vs. Experience in Regard to Post Timbering

Rules Enforced of More Value Than a World of Experience—Penalty Makes Rules Effective
—Systematic Timbering Surest Safeguard

WRITING on the subject of "Posting the Face of the Coal in Driving Rooms," *Coal Age*, Aug. 2, p. 181, George Edwards has enunciated a principle worthy of the most careful consideration. I agree with him that it forms the underlying foundation in mine timbering and as such should be heeded earnestly by every miner.

Nothing can express more forcibly the truth conveyed in the writer's own words, "One post promptly and properly set is a greater safeguard than a world of experience in the mining of coal." Judging from what others have said, on this subject, I believe their experience is in accord with my own conviction that it is far better to enforce strict rules and regulations, in regard to timbering, than to leave the matter to the whim of the miner, notwithstanding his experience.

The practice of miners in regard to when and where they should set timbers to make their places safe for work has clearly demonstrated the unreliability of dependence on their judgment. This is shown by the fact that numerous coal-mining companies have found it necessary to establish timber rules and, in many cases, severe penalties are imposed for any violation of the rules.

PENALTY FOR VIOLATION OF RULES INSURES RESULTS

Even where the rules are strictly enforced, results show that they are of little value, unless each rule carries a suitable penalty for its violation. Many experienced miners become so inured and hardened to danger that they are prone to take wholly unnecessary chances on their lives, in the effort to finish loading a car before setting a post.

It has been my experience that even when an experienced miner uses care and judgment to insure his own safety he cannot always tell when he is in imminent danger from bad-roof conditions. In one district with which I am familiar, the miners are troubled with what they call "blind rolls," that are more like the well-known "pot bottoms" in other localities.

In that district, many of the companies have made stringent rules in respect to the setting of timbers at the working face. The formation overlying the coal is such that the roof slate will give practically no indication of weakness when a stone, from 10 to 20 ft., in diameter, and anywhere from 2 to 6 ft., in thickness, will drop from the roof without warning. Previous to the establishment of the rules, many experienced and inexperienced miners were killed.

When timber rules have once been posted the experienced miner has no argument that he can offer the mine foreman as an excuse for not having timbered his place according to the rules. The foreman is saved much annoyance and embarrassment caused by the persistence of experienced cranks, who protest against doing what they consider unnecessary work in the timbering of their places. The foreman has only to refer them to the rules.

Mr. Edwards has mentioned the supposed difficulty in reference to setting face timbers in machine mining. In Alabama, this is no problem at all. Practically all of our mines have timber rules that are strictly enforced. Each miner sets his props according to rules, without reference to the machine.

ALABAMA LAW FOR MACHINE RUNNERS

The Alabama State Mining Law requires a machine runner to replace all props removed by him in cutting the coal. This does not, as some may suppose, impose a hardship on machinemen. In the instance cited by Mr. Edwards, the claim of the machine runner and the mine foreman, that they must have 14 ft. between the face of the coal and the timbers is wholly false. Such a clearance is quite unnecessary when the work is properly managed.

It is well known that, with continuous coal-cutting machines, after sumping the cutterbar a clearance of only 6 or 7 ft. is required for the machine to pass the timbers, in moving along the face of the coal. A scheme that is often adopted, here, is to let the motor and gear housing lag a little behind the cutterbar. In other words, the machine is kept at a slight angle with the face of the coal.

TIMBERS REMOVED AND RESET AS MACHINE PASSES

In one instance, to my knowledge, the timber rules call for a distance of 4 ft. between the first row of props and the face of the coal. All props are set 4 ft. apart, in every direction. The rooms are 35 ft. wide, and two tracks are laid in each room. The machine enters, say on the left-hand track. At the face, one prop is taken out to allow the machine to be swung around ready for moving across the face. The 4-ft. space, between the first row of props and the coal, is ample for that purpose.

Then, before pulling the machine across the face, the prop on the left is replaced. On reaching the other side of the room, a prop on that side is removed to permit the machine to be again swung around ready for sumping. The cutting then proceeds until the machine reaches the second prop, which is removed after the first prop has been replaced. In this manner, the machine proceeds to cut the coal, each prop in turn being removed and reset as the machine passes.

Finally, on reaching the left-hand side of the room, the machine is withdrawn from the coal and reloaded

ready to be moved to the next place. Under this system, when the miner starts to shoot his place every prop is standing a maximum distance of 4 ft. from the face of the coal. Any props that may be knocked out by the shots are promptly reset, before the work of loading the coal is commenced.

Inasmuch as the props are now quite a distance from the solid coal, the miner is required to load his coal along the entire face, to permit another row of props to be stood, and this must be done before the remaining coal is loaded. A casual examination of the roof in this mine would not seem to demand that these precautions are necessary.

However, systematic timbering is the surest safeguard and this plan was adopted after the occurrence of many accidents proved it to be unwise to depend on the judgment of the miners in making their places safe. The good results obtained have proved the wisdom of the plan.

JOHN WALLS, SR.

Ensley, Ala.

Working Three Continuous Seams of Coal

Many things considered in choice of best method of working—Numerous advantages in longwall method—Value of coal and relative costs of handling waste material the determining factors.

THE discussion following the inquiry that appeared in *Coal Age* some time since, regarding the best method of working three seams of coal separated by thick partings of shale and slate, has interested me greatly. I quite agree with James Gray, whose letter appeared in the issue of Sept. 13, p. 403, regarding his choice of the longwall method of working these seams.

Without inspecting a field and studying the conditions as they exist, it is difficult to arrive at a correct conclusion regarding the best and most profitable method of working any coal seam. There are always many different items to be considered and to disregard any one of these may result in failure. The success of the proposition depends primarily on a thorough knowledge of the situation, in any given case.

In the past, I have conducted operations in the mining of coal seams where the partings would vary from 6 in. to 9 ft., in thickness, making the conditions encountered similar to those described in this inquiry. My experience has convinced me that there is no system of working better adapted to the working of such coal than the longwall method of mining. One strong argument in its favor is that there is no deadwork required, such as is necessary in room-and-pillar work.

ADVANTAGES OF LONGWALL METHOD

The practical advantages presented by the longwall method are numerous. Not only does it lessen the cost of production and afford a larger output from a comparatively small area, giving a greater concentration of work, but there results a more complete extraction of the coal, less explosives are required and less trackage, with a reduced cost of upkeep, and the ventilation of the mine is more easily effected.

From the information given it is not clear whether it is desired, or advisable, to remove the 12 in. of bottom coal, which would involve the handling of the large amount of waste material forming the lower parting. This question can only be determined by the value of the coal and the relative cost of handling the slate parting, which is from 18 to 24 in. thick.

As suggested by Mr. Gray, in order to gain height on the roadways, the lower parting and the bottom coal may be lifted for that purpose, provided the coal is hard enough to resist being crushed by the weight coming on the pillars, as the face is advanced. My preference would be to take down the upper parting to the top coal, using this waste material for building the necessary packwalls to maintain the roads. There will then be less danger of loading dirty coal when taking down the upper seam in retreating.

In planning the work by the longwall method, the slant roads must be laid out so as to cut off the rooms at not too great a depth or length. These slant roads are driven on an angle of 45 deg. with the main road. As each slant road cuts off the rooms, the work of taking down the top coal is started at that point and conducted on the retreating plan.

It is not necessary to wait until the rooms driven in the middle seam have reached their limit, or the boundary line. It is important, however, when that is done to leave sufficient pillars in the top seam to protect the roadways in the seam below.

Taking everything into consideration, I believe the better plan would be to push the work in the middle seam to the boundary, before attempting to extract the top coal on the retreating plan. Then, when retreating use can be made of the same roadways in the middle seam, by building simple inexpensive chutes for loading the top coal into the cars standing on the track below. Wherever practicable, the use of conveyors at the coal face will greatly reduce the cost of production, by requiring a less number of roadways to be kept open and reducing to a minimum the building of the necessary packwalls.

COAL INSPECTOR.

McKeesport, Pa.

Marsaut Type of Safety Lamp

Thousands of this type of lamp in use—Important to know in what respect the lamp is weak or unsafe—What experiments have shown regarding the possibilities of failure.

AMONG the letters that have been contributed regarding the various aspects of the explosion that occurred in the Wakesiah coal mine, Nanaimo, B. C., Nov. 24, 1922, all but one writer assigned the cause of the explosion to the failure of the Wolf-Marsaut, bonneted safety lamp carried by the fireboss.

At the time, the fireboss had almost completed his inspection of the mine, previous to allowing the day-shift to enter for work. Owing to this fact, there were but 13 men at work in the mine. All of these escaped, except two—the pumpman who was standing on the main slope and was killed by flying coal blown from a trip of cars near him, and the unfortunate fireboss whose act was the primary cause of the explosion.

Inasmuch as there are, today, thousands of lamps of the Marsaut type in use in the mines of this country and on the Continent, the question of the safety of the lamp, under all conditions that may arise in coal-mining practice, is one of absorbing interest. Unfortunately, in this case, a certain mystery surrounds the occurrence, in respect to both the conditions and use of the lamp claimed to have failed.

One uncertain feature is the lack of knowing the exact conditions to which the lamp was exposed. From

all accounts, it appears that it was not in the hands of the fireboss and under his control at the supreme moment. While it is said that the fireboss was not seriously burned, his death being due to suffocation in the afterdamp of the explosion, we are told in the report of the disaster that the man's cap was badly burned.

Now, if we assume that the fireboss used his cap in an attempt to smother the flame of the gas burning within the lamp, we must admit that the man himself would have been badly burned. Or, had the cap been on his head, its being burned would point to a similar condition of the man's body.

In view of these conflicting aspects, we are left to surmise only as to the actual manner in which the lamp was handled, or as to what took place at the fatal moment. Evidently, a few seconds elapsed between the fireboss losing his cap close to the lamp, and his reaching the place where his body was found, at a distance of 84 ft. from the lamp.

What is of prime importance, in this matter, is to ascertain the actual conditions that surrounded the lamp. All the witnesses agree that much finely powdered coal dust was present and became a factor in the initiation of the explosion. That the lamp was surrounded by an atmosphere highly charged with fine dust is only natural to assume; but what seems remarkable and, to my mind, quite impossible is the statement that the interior of the lamp gauzes showed signs of being intensely heated, while the outside of the wires gave no such evidence.

WEAK POINT IN THE MARSAUT CONSTRUCTION

To my knowledge, experiments have proved that the safety of lamps of the Marsaut type is seriously reduced by the presence of fine coal dust in the ventilating current; but I know of no experiment having been made, with firedamp burning in a lamp surrounded by a dust-charged atmosphere, when the lamp did not fail.

My conclusion is that such a condition forms the most plausible explanation of this disaster. In the same connection, it is interesting to recall that the eminent French mining engineer, the inventor of the lamp that bears his name, discovered where the peculiar weakness lay in this type of construction. Marsaut found that when the lamp was raised vertically into a quiescent atmosphere of pure or nearly pure methane, so that the sharp gas entered and filled the top of the lamp, the result was an explosion took place within the chimney of sufficient force to drive the flame through the gauze and ignite the gas outside. This has been proved by experiment; and there are a few instances on record showing the failure of this type of lamp under such conditions.

The original Marsaut pattern had no air ring to admit the air below the wick flame, which is one of the features of the Wolf lamp of the Marsaut type. Although this feature adds to the lighting value of the lamp, in my opinion, it has a tendency to reduce the safety value of the lamp and render it less sensitive to the detection of gas. Seeing that this lamp is now used in Vancouver Island coal mines, exclusively for testing purposes by firebosses and not for the purpose of giving them light, I would suggest that there would be an advantage if the air holes admitting the air below the wick flame, were closed, or did not exist, which would make the lamp conform to the original pattern of the bonneted Marsaut safety lamp.

Cowley, Alberta.

JAMES ASHWORTH,
Mining Engineer.

Inquiries Of General Interest

Mechanical Every-Day Problems In Mining Practice

Kinetic Energy of Moving Trip of Cars—

Size of Ventilating Fan and Engine Required for a Given Circulation in Mine

IN CONNECTION with duties that have fallen to my lot as mine engineer, I have been delving much recently into the intricacies of mechanics, much of which I have found beyond my comprehension and ability to understand and apply, in the practical solution of problems that arise in the mine. *Coal Age* has been a great help to me, in more ways than one, and I want to ask for its assistance in working out two problems that have given me trouble.

First, what is the kinetic energy of a moving trip of six cars, each weighing when loaded 3,500 lb. I want to estimate on a speed of hauling at four miles per hour and compare this with the energy that would be developed should this trip break loose and descend an incline or slope at an estimated speed of 15 miles per hour.

The second problem is to find the size of the fan and engine required for the circulation of an air current of 160,000 cu.ft. per min., against a water gage of 3 in., assuming the fan is direct-connected or belt-driven and running at a speed of 120 r.p.m., taking the steam pressure at the throttle as 120 lb. per sq.in. and supposing the engine cuts off steam at one-third stroke. I want to estimate on a piston speed of 300 ft. per min. If this fan is operated by an electric motor what current will be required at a pressure of, say 500 volts?

Michel, B. C., Canada.

MINE ENGINEER.

Regarding the first question, the kinetic energy of a moving body is the energy it possesses by virtue of its mass and velocity and is expressed by the formula $\frac{1}{2}mv^2$. It is measured by the work given out by the body in bringing it to rest and is expressed in foot-pounds. Calling the weight of a body w , its mass m , the height through which it falls h , and the force of gravity g , we have, for the kinetic energy developed at any given velocity v , since $m = w/g$ and $v^2 = 2gh$

$$\frac{mv^2}{2} = \frac{w}{2g} (2gh) = wh$$

The weight of a trip of six cars weighing 3,500 lb. each, is $6 \times 3,500 = 21,000$ lb. For a speed of 4 mi. per hr., the velocity of the trip is $4 \times 5,280/60 = 352$ ft. per min., or $5.8\frac{2}{3}$ ft. per sec. Then since $g = 32.16$ ft. per sec.,

$$\text{Kinetic energy} = \frac{21,000}{2 \times 32.16} (5.8\frac{2}{3})^2 = 11,237 \text{ ft.-lb.}$$

Again, for a speed of 15 mi. per hr., or $(15 \times 5,280) \div (60 \times 60) = 22$ ft. per sec., the kinetic energy is $(21,000 \times 22^2) \div 64.32 = 158,022$ ft.-lb.

In determining the dimensions of a fan for any required circulation, it is first necessary to estimate the

potential factor of the circulation, as expressed by the ratio of the quantity of air passing, to the square root of the pressure in the fan drift. Thus, to pass 160,000 cu.ft. per min., against a 3-in. gage, this potential factor is $X = 160,000 / \sqrt{5.2 \times 3} = 40,510$.

The outer diameter (D) of a fan required to circulate a quantity of air (Q), against a potential factor (X), at a speed of n revolutions per minute, may be found by the formula

$$D = 467 \frac{Q}{Xn} = \frac{467 \times 160,000}{40,510 \times 120} = 15.37 \text{ ft.}$$

The same result may be reached in another way. For example, general fan practice has shown that the best results are obtained when the fan is capable of producing a theoretical water gage that is 40 per cent in excess of the gage required in the fan drift. Or, calling the theoretical water gage I , we have in this case $I = 1.40 \times 3 = 4.2$ in. On this basis, the outer diameter of a fan capable of producing a theoretical water gage $I = 4.2$ in., at a speed $n = 120$ r.p.m. is

$$D = 900 \frac{\sqrt{I}}{n} = \frac{900\sqrt{4.2}}{120} = 15.37 \text{ ft.}$$

Assuming an efficiency of the steam engine driving the fan as, say 85 per cent, the required indicated horsepower of the engines is

$$H = \frac{160,000 \times 5.2 \times 3}{0.85 \times 33,000} = 89, \text{ say } 90 \text{ hp.}$$

Then, taking the steam pressure at the throttle as 120 lb. per sq.in., the engine cutting off steam at one-third stroke, gives for the mean effective pressure in the cylinder,

$$0.9[0.743(120 + 14.7) - 17] = \text{say } 75 \text{ lb. per sq.in.}$$

Finally, estimating on a development of 90 hp. in a single cylinder, a mean effective pressure of 75 lb. per sq.in. and a piston speed of 300 ft. per min., gives for the diameter (d) of the steam cylinder

$$d = \sqrt{\frac{33,000 \times 90}{0.7854 \times 75 \times 300}} = 12.96, \text{ say } 13 \text{ in.}$$

For direct connection or belt-drive, the fan making 120 r.p.m. and the engine 240 strokes per minute, the length of stroke is $300/240 = 1.25$ ft., or 15 in., which makes the required size of the engine 13x15 in.

To develop 90 hp. electrically, under 500 volts pressure, will require a current of $(746 \times 90) \div 500 =$ say 135 amp.

ventilated under a pressure less than that of the atmosphere. This is accomplished by connecting the fan drift with the intake opening of the ventilator. The action of the fan then creates a depression in the fan drift, and the atmospheric pressure on the intake opening of the mine forces the air into the mine against that depression. The advantage, in the application of the exhaust system, is that the hoisting shaft and main haulage road are the downcast and intake airway, respectively, which keeps them free from gas.

The exhaust system is particularly adapted to the ventilation of a gassy mine. In either system, however, it is assumed that the fan is installed at a separate air shaft, which becomes the downcast shaft in the blowing system but is an upcast shaft in the exhaust system of ventilation. The disadvantage of the exhaust system lies in the fact that, the mine being ventilated under a pressure less than that of the atmosphere, there is a tendency for any gas generated in the adjoining strata, or accumulated in abandoned areas, to flow into the mine workings. Again, the movement of the loaded cars passing out of the mine offers an increased obstruction to the intake current and, to that extent, increases the mine resistance and the power required for ventilation. Also, all the dust of the main haulage road is carried into the workings.

QUESTION—How would you remember a gangway that had caved, if three sets of timber were broken down and the case liable to run?

ANSWER—This condition requires extra precaution being taken to avoid accidents. After a careful examination of the timbers and before disturbing the old sets, temporary timbers should be stood to guard against the fall of the loose material when the broken timbers are removed. It may be possible to stand new sets of timbers between the old ones, as permanent timbers. When this has been done one of the old timber sets should be carefully removed, taking care to avoid the men being caught by a possible fall of the loose slate above. As one old set is removed a new set of timbers should be inserted in its place. In this manner, the work should proceed, taking down one set at a time and standing new timbers in their places.

Examination Questions Answered

Examination for Mine Foremen, Olympia, Wash., Aug. 1, 1923

(Selected 1st-Class Questions)

QUESTION—Explain the constant 5.2, used in connection with water-gage calculations.

ANSWER—The constant 5.2 represents the pressure per square foot due to a water column 1 in. in height. Since the weight of 1 cu.ft. of water is 62.5 lb., the weight of a layer of water covering 1 sq.ft. of surface and 1 in. in depth is $62.5 \div 12 = 5.2$ lb. The pressure exerted on any given surface being measured by the depth of the water and the surface pressed, 1 in. of water column always represents a pressure of 5.2 lb. per sq.ft.

QUESTION—State what systems of ventilation you are familiar with. Give the advantages and disadvantages of each.

ANSWER—The two common systems of ventilation are known as the “blowing” and the “exhaust system,” respectively. In the blowing system the air is forced into the mine under a pressure greater than that of the atmosphere, by means of a fan or other device capable of creating a pressure. The particular advantage of the blowing system is that any gas generated in the roof or overlying strata, or accumulated in abandoned areas, is forced back and often escapes through fissures reaching to the surface. If the system has any disadvantage, it lies in the fact that in case of a breakdown of the fan the resulting drop in pressure will be accompanied by an increased outflow of gas from the strata and abandoned places.

In the exhaust system of ventilation, the mine is

U. S. Coal Commission Arraigns Jobbers in Report on Distribution; Suggests Regulation in Emergency

Wholesalers' Margins Said to Have Risen 200 Per Cent from Pre-War Figures—Too Many Handlers and Pyramiding During Shortages Blamed for High Prices—Retailers Dealt with Gently

Wholesale dealers in coal during recent years have been exacting profits in some instances 200 per cent above their earnings in pre-war years, according to the report of the U. S. Coal Commission on the wholesale and retail coal trade, made public Oct. 21. The retail coal dealer is practically exonerated of responsibility for high prices. The report, which relates to both anthracite and bituminous coal, is a bulky one, comprising about 50,000 words, with numerous tables covering margins, expenses, profits, investments and tonnage handled.

Among the causes of the high price of fuel, the commission says that it found an unnecessary duplication of service with too many handlers in the industry between the mine and the retailer. Coal was sold from wholesaler to wholesaler before it ever reached the retailer. Sometimes this reselling would take place twice or three times. The maximum number of resales discovered was four.

The Commission attacked this extravagance in the industry in its recommendations to President Coolidge and Congress that the government be given power to regulate the distribution of fuel in times of shortage.

Dealing with ninety wholesalers who made reports, the Commission finds that profits have mounted each year. In this connection the report says:

"The showing made for the trade as a whole for the entire United States is that with a total profit of 3.6c. in 1913, the ninety concerns reporting made a return on total capital of 19 per cent, and on net proprietor's equity, after paying interest on borrowed money, 24.1 per cent, and, in 1922, the 424 wholesalers reporting with a total profit of 7.3c. per ton, made returns of 21.8 per cent on total investment, and 25.6 per cent on proprietor's equity.

"In 1917 with a profit of 10.9c., the 182 firms reporting made 45.4 per cent on total investment and 54.8 per cent on proprietor's equity. In 1920, the banner year, the 333 wholesalers covered, with a net profit of 15c. per ton, realized 55.2 per cent on total investment, and 66.6 per cent on net proprietor's equity. In every year except 1921 the return on total investment was greater than 15 per cent and that on proprietor's equity was greater than 18 per cent."

TOO MANY WHOLESALERS IN ANTHRACITE TRADE

The Commission concludes that in the anthracite trade there are too many wholesalers. "The explanation of this undue attraction of new capital to the trade," it says, "is to be found in the high profits on investment realized in the business."

Discussing gross margins and profit per ton and on investment the report has this to say:

"The years 1917 and 1920 were the years of highest margins and profits per ton in all groups. The large profits per ton were reflected in high earnings on investment in those years for all groups. The year 1921, although a year of relatively high margins, was a year of depression in the wholesale trade in all groups; expenses were high and profits were low. One group in 1921 showed a small loss of 2c. per ton on coal handled, but other income changed this loss into a small gain. In this year the rates of earnings shown by the different groups were the lowest shown for the ten-year period.

"In general, the earnings of the ten-year period were large for all groups. Rates of return on total investment of 40 per cent or more were made by every group in one or more years. The lowest rate was 1.5 per cent by the anthracite-less-than-50-per-cent group in 1921.

"With the one exception of the dull year 1921, the total investment would be returned in profit, at the rates shown,

in periods ranging from about one and two-thirds to eight years for the different groups, with from two and one-half to four years or five years as the period most often required. On net proprietor's equity, representing what the owners have in the business, the rates of return were greater, and the periods required to return the total proprietor's equity correspondingly less. Here again 1921 was, of course, the poorest year for all groups."

In summarizing its findings in regard to wholesalers the commission makes these observations:

"Although the independent wholesaler occupies a necessary place in the distribution machinery for coal, the nature of the business is such as to make possible undesirable speculative activities on the part of wholesalers in times of shortage. Coal, both for industrial and household purposes, is a prime public necessity. Recurring shortages, with their periods of wild speculation, tend to attract too much capital into the wholesale trade. The result is more wholesalers than are necessary to conduct the business. In times of shortage, speculative buying and selling among the excessive number of concerns results in great duplication of function and enhanced prices to the consumer."

ANTHRACITE MAKES FERTILE FIELD FOR SPECULATOR

"Anthracite, because it is a limited natural resource, the demand for which in recent years has pressed closely upon production at all times, with limited possibility of substitution of any other fuel equally satisfactory for household use, occupies the position of a necessity of life in many communities habituated to its use and therefore yields readily to the speculative activities of the wholesaler."

"The Commission's study indicates that there are altogether too many wholesalers, but that, notwithstanding this fact, the wholesale trade has made large profits in most of the ten-year period from 1913 to 1922, inclusive, and excessive profits in the panic years 1917 and 1920. The year 1922 generally showed more moderate and even small earnings, due to curtailment of tonnage on account of the strike.

"The Commission's study also indicates that in times of shortage the pyramiding of wholesale margins through the speculative activities of wholesalers results in the enhancement of prices, without furnishing the public an equivalent in distribution service.

"Recurring periods of shortage with wild wholesale speculation point to the need of a public service viewpoint respecting the entire coal trade, backed by legislation providing for strict regulatory powers, on the part of the federal government over the entire production and interstate distribution of coal in order that American industries and households shall at all times be assured of continuous and adequate supply of coal at reasonable prices. The exercise of such regulation is especially good in times of shortage and wildly fluctuating prices.

"When real competition for the purchaser's tonnage exists, such competition is probably the cheapest and most efficient regulator of wholesale margins, but in times of shortage it fails entirely. It may therefore be desirable to set up skeleton regulative machinery which shall be put into operation when, and only when, in the judgment of the President an emergency exists, thus limiting active regulation to periods of national emergency."

URGES LIMITATION OF PROFITS

"The power to regulate should include the power to limit, to a definite maximum amount per ton, the margins that may be taken by one or more wholesalers between the mine and the retailer or consumer, thus limiting speculative

wholesaling. The maximum amount of margin should be the same whether taken by one or by two or more wholesalers.

"The experience and practice of the Federal Fuel Administration along this line furnishes basic information of great value, both as to method and workability of such regulation. All regulatory powers should be backed by adequate penalties for violation of regulations promulgated by the government or its regulatory agency, with necessary outlining of court jurisdiction for their enforcement in cases of violations and of review in cases of aggrievements arising out of regulations promulgated.

"Regulation of wholesale margins to a definite maximum amount per ton would go far toward eliminating the abuse of the reconsignment privilege by which unscrupulous wholesalers, after selling a car of coal to one retailer or consumer, finally sell it to some other who will pay a higher price for it.

"Greater publicity should be given to the inter-relations of nominally independent wholesalers and operators through interlocking stock ownership and officers. Such information should be in the hands of the government agency charged with the duty of regulation of both the production and distribution of coal, to serve as a basis for intelligent decision as to whether a given wholesaler is entitled to pose as independent of the operators from whom coal is purchased.

"In the case of anthracite coal, the Commission's inquiry indicates that during the past year the passing of coal through the hands of wholesalers, with arrangements to split commissions back to the operator, was used by some operators as a means of obtaining higher prices on interstate commerce shipments than those approved by the Fair Practices Committee of the Pennsylvania Fuel Commission."

MUCH CRITICISM OF RETAILERS UNJUST

Dealing with the retail coal trade, after stating that the retail trade presents problems distinctly its own, and mentioning the frequent great public dissatisfaction with the prices charged and the general conduct of the business, the Commission says:

"In some cases such criticism is undoubtedly well founded, but in others it is based on lack of knowledge on the part of the public that the causes of the high prices and shortages of coal felt by the consumer are beyond the control of the retailer. Frequently, public opinion is unjustly aroused against the retailer by inflammatory newspaper articles. On the whole it would seem that what is needed is a better understanding of the trade and its problems on the part of those whom it serves, and more discriminating criticism.

"Recent high prices have encouraged co-operative buying experiments and municipal coal yards as attempts to cut the costs of fuel to the consumer. This is a part of the general trend of public opinion toward a public service viewpoint regarding the production and distribution of coal. The organized retail trade generally opposes such experiments, as they jeopardize the position of the established retailer wherever they are successful. Such movements should be given a fair trial to demonstrate whether they can furnish the same service to the public at a less cost than the estab-

lished retailer. If they can do so they will survive. If they cannot the established retailer will survive as the most efficient method of retail distribution.

"The results of the Commission's inquiries regarding the retail trade indicate that it is generally conducted on a competitive basis. Prices and margins have increased sharply in all sections of the country since 1918. Expenses, also, especially in the last two years, have increased so that net profits per ton and on investments have shown a tendency to decrease.

"During the five-year period, 1918 to 1922, the average rates of profit of retail dealers throughout the country have generally been moderate, and much less than those of wholesalers. In some sections of the country they have been small, while in others they have been fairly large. For the country as a whole, the earnings of 273 identical companies ranged from 11.6 per cent to approximately 23 per cent on total investment, and from 12 to 25 per cent on owner's investment in different years.

"The effect of premium anthracite coal on the retail trade is to make direct business connection with one or more of the big companies which do not sell their product at premium prices of prime importance to a successful retailer. In fact, such direct connection has, during recent years, been more important that real efficiency in retailing in determining what retailers in the anthracite territory will be able to stay in the business. So long as such conditions continue, competition based on real efficiency of retailing can have but little effect in eliminating the really inefficient dealer from the trade.

"The forcing of small sizes upon the retailer by both operators and wholesalers is a practice that works hardship upon the retailer whose trade is not equipped to absorb steam sizes.

"In general, the competitive nature of the retail trade makes regulation of margins and prices unnecessary, except in cases of emergency shortage. In case such emergency regulation is necessary, it should be a part of a fully co-ordinated scheme of regulation covering the production, wholesale distribution and retail distribution of coal.

"In case price regulation is attempted, it, in fairness to the retailer and the public, should take the form of regulation of margins, other than the fixing of definite prices. Such regulation of margin permits the setting of different maximum margins to cover different types of trade, and different amounts of service rendered by city and country dealers.

"This Commission is firmly of the opinion that the solution of the problem of extortionate charge for retail coal, where it exists, is largely in the hands of the communities themselves and that where the public is alert to its rights and ready to apply the remedy no such problem will exist."

THE ADVISORY COMMITTEE which is being set up to cooperate with the coal division of the Department of Commerce will be composed of fifteen members. Three members will represent each of the following branches of the industry; bituminous operators, anthracite operators; wholesalers, retailers and transportation. The personnel of the committee has not been determined as yet.

Bituminous Coal Loaded Into Vessels at Lake Erie Ports During Season to End of September*

	(In Net Tons)			1923			1922			1921		
	Cargo	Fuel	Total	Cargo	Fuel	Total	Cargo	Fuel	Total	Cargo	Fuel	Total
Toledo	3,584,242	108,355	3,692,597	2,338,742	65,804	2,404,546	3,392,526	90,626	3,483,152			
N. Y. C.-Ohio Central Lines	1,084,724	33,778	1,118,502	363,417	10,194	373,611	912,039	25,463	937,502			
Baltimore & Ohio	2,161,529	62,473	2,224,002	2,110,904	54,083	2,164,987	2,019,800	59,071	2,078,871			
Pennsylvania	2,295,788	72,405	2,368,193	1,689,727	64,397	1,754,124	1,221,981	35,303	1,257,284			
Huron	1,113,192	43,238	1,156,430	162,483	7,958	170,441	1,418,326	40,134	1,458,460			
Lorain	2,537,212	141,950	2,679,162	576,243	42,223	618,466	2,176,645	87,837	2,264,482			
Cleveland	1,400,296	151,749	1,552,045	383,651	64,285	447,936	1,768,313	73,258	1,841,571			
Fairport	590,203	26,781	616,984	106,874	4,295	111,169	355,964	12,071	368,035			
Baltimore & Ohio	586,570	56,185	642,755									
New York Central	2,568,081	198,358	2,766,439	615,853	45,361	661,214	959,835	52,381	1,012,216			
Pennsylvania	1,564,206	69,647	1,633,853	583,253	56,028	639,281	1,922,167	63,910	1,986,077			
Conneaut	2,099,299	178,745	2,278,044	544,240	26,333	570,573	1,090,156	14,732	1,104,888			
Erie	475,659	63,970	539,629	82,115	49,849	131,964	910,484	51,829	962,313			
Totals	22,061,001	1,207,634	23,268,635	9,557,502	490,810	10,048,312	18,148,236	606,615	18,754,851			

* Compiled by Ore & Coal Exchange, Cleveland, Ohio; H. M. Griggs, manager.

Trade Commission Charges Conspiracy to Enhance Anthracite Prices

As a result of an inquiry, instituted at the direction of President Coolidge, into alleged unfair practices in the anthracite business the Federal Trade Commission has filed a complaint against the operating firm of Madeira, Hill & Co., of Philadelphia, and the following wholesalers: Pattison & Browns, of New York; the Titan Fuel Corporation, of New York; Hartwell & Lester, Inc., of New York and Massachusetts; Clement P. Brodhead, of New York, and Lynn M. Rainger, of Boston.

The Trade Commission alleges that Madeira, Hill & Co. exacted a rebate from wholesalers varying from 50c. to \$2.50 per ton. The defendants have been summoned to appear before the Commission Nov. 19, when a hearing will be held on the charges.

Charles E. Lester, president of Hartwell & Lester, Inc., in a letter to *Coal Age*, says: "We have not, subsequent to Oct. 23, 1922, the date mentioned by the Commission, purchased from Madeira, Hill & Co. any of either of the two sizes of anthracite referred to, with the exception of four cars of washery chestnut, which were both purchased and resold by us at a price less than \$10.50 per gross ton at the mines. We have never entered into any secret understandings or agreements, such as charged by the Federal Trade Commission, either directly or indirectly, with Madeira, Hill & Co., nor have we ever rebated, refunded or paid in any manner, either directly or indirectly, any moneys in excess of the price at which coal was purchased and orders confirmed by us."

C. P. Brodhead, president of the firm which bears his name, said: "We have never been a party to any secret rebates, nor have we been engaged in any conspiracy, nor have we ever adopted illegitimate methods in our business."

Gardner Pattison, of Pattison & Browns, characterized the Trade Commission's investigation as "a fishing expedition." "In common with other prominent coal firms," he said, "we have always conducted our business in a perfectly open-handed manner. I shall be very pleased to meet any charges which the commission lays before me, and I am quite certain that after representations have been made at Washington these absurd complaints will be dropped."

The Titan Fuel Corporation "denies that they ever entered into any secret condition, understanding or agreement, in writing or verbally, either directly or indirectly, with Madeira, Hill & Co. to rebate or refund to them directly or indirectly, any part of the margin or profit realized over and above the price the coal was purchased for."

Special Government Prosecutors Major David A. L'Esperance and Rush Williamson, who at the direction of Colonel William Hayward, United States Attorney at New York, are conducting an investigation into the matter of the alleged scarcity and high price of anthracite, interrogated a number of hard-coal dealers Oct. 17. As the inquiry was not yet fully under way, the officials declined to discuss the information they had obtained.

Kanawha Operators in Big Annual Meeting

The meeting of the Kanawha Coal Operators' Association at Charleston last week was better attended than any previous gathering of that association. New membership representing more than three million tons was enrolled. The election of officers resulted as follows: John Laing, president; H. D. Morton, vice-president; John L. Dickinson, treasurer. D. C. Kennedy was re-elected secretary. Directors were named as follows: E. O. Dana, F. O. Harris, W. M. Wiley, H. L. Warner, W. C. Mitchell, C. A. Cabell, F. H. Morton, H. D. Morton, John Laing.

One of the features of the meeting was a luncheon at the Kanawha Hotel. Colonel Quinn Morton acted as toastmaster. When President Laing was introduced he was given an ovation. In his remarks he stressed the necessity of co-operation among operators to meet the crisis through which the coal industry is passing. Harry L. Gandy, secretary of the National Coal Association, reviewed the conditions which led to the creation of the Coal Commission

and discussed the plans of the Bituminous Operators' Special Committee. Colonel Chris Hetzel spoke in a humorous vein and urged co-operation. Other speakers were H. D. Morton and E. O. Dana.

N. C. A. to Have Full-Time President?

Whether or not the presidency of the National Coal Association will be given a salary status will be determined in the near future by the Bituminous Operators' Special Committee. It has been recognized since the organization of the association that a great sacrifice was required of the man elected to the presidency. The duties of that office are such as to require a considerable portion of the time of the incumbent. This has been the case particularly during the trying times of the last two administrations.

The committee is to determine whether or not a salary should be paid for part-time work—sufficient to equalize the loss of time from the president's private business—or to place the salary at a figure sufficiently attractive to justify the president in giving his entire time to the affairs of the association. Some of the members of the organization are anxious to see the president of the National Coal Association made a sort of high priest of the bituminous industry, a position comparable to that occupied by Will Hays in the motion-picture industry.

It is not the idea to give the president a permanent status, it is understood. Even if it should be decided to attach a salary to the presidency it is probable that re-election would be necessary each year in conformity with the constitution of the association. If some such proposal were to be made effective, it is practically certain that the membership of the association will insist on the acceptance of the place by J. C. Brydon.

O'Malley Orders Gouging Inquiry

Edwin J. O'Malley, Commissioner of Public Markets of New York City, made the charge Oct. 20 that the "old-line coal companies," which at present claim to be offering coal to consumers at the lowest prices, are resorting to unfair methods and sending most of their production to independents at increased rates, and asked his Deputy Commissioner, Mrs. Louis Reed Welzmillier, to investigate.

Mr. O'Malley said he had been told that while the companies which control 80 per cent of the anthracite advertise coal at low prices, and actually send out a certain quantity at these prices, the balance of their production is sold to the independents at an increased rate. This, he said, was characterized as "backdoor coal."

"In order to control the entire coal situation," said O'Malley, "the old-line companies sell only a limited quantity to a favored few retailers. The retailers out of the ring are not permitted to buy of the old-line companies and are therefore forced to purchase coal of the high-priced independents, to whom the old-line companies have sold by way of the 'back door.' These unfortunate retailers are obliged to charge the consumer what are apparently exorbitant prices."

Dr. E. W. Parker, director of the Anthracite Bureau of Information at Philadelphia, reported Oct. 20 that between April 1 and Aug. 31 this year 2,914,873 tons of domestic anthracite were shipped into New York and its environs, against 2,455,416 tons in the same period in 1921.

The coal survey of New York ordered by Police Commissioner Enright was completed Oct. 20 and showed a total of 183,230 tons of all kinds of coal and substitutes on hand by dealers. The report showed that there is no great surplus of coal in the city, and most of the 129 dealers interviewed said there is no certainty as to the amount they can obtain from one week to another. The supply at present is just about enough to meet the demand for domestic coal.

Commissioner Enright's survey revealed that prices range from \$14.25 to \$15.25 per ton. All dealers agree that there is no fear of a coal famine.

GERMANY HAS MORE DESTITUTE MILLIONAIRES than were ever known in history.—*Birmingham Age-Herald*.

Trade Commission Issues First Report on Anthracite Wholesalers' Margins

Margins realized on individual cars by wholesalers of anthracite who purchase and sell in carload lots "without physically handling the coal" ranged during the week ended Sept. 22 from 10c. to \$1.50 per ton, while on steam sizes it ranged from a loss of 15c. per ton to gains of 70c. per ton, according to the Federal Trade Commission, which has just issued the first of a series of weekly reports. The margins realized on over 50 per cent of the sales reported of anthracite steam coal, the Commission says, were 10c. or 25c. per ton, while nearly 78 per cent was at 10c., 15c., 20c., and 25c. per ton.

President Coolidge requested the Federal Trade Commission to examine the findings of fact of the U. S. Coal Commission to ascertain whether the passing of anthracite, especially, through numerous hands before it reaches the consumer is really a device by which the price is unduly raised and, perhaps, constitutes an unfair trade practice. The Trade Commission is continuing the reporting plan formerly used by the Coal Commission in order to obtain first-hand information currently regarding the margins taken and the number of wholesalers intervening between the mine and the retailer.

"Sixty per cent of the total number of cars of domestic sizes of coal reported for the week ended Sept. 22," the Trade Commission says, "were purchased by the reporting wholesaler from a producer and sold to a retailer or consumer, thus passing through the hands of but one wholesaler. Thirty-two per cent were purchased by the reporting wholesaler from a wholesaler and sold to a retailer, thus interposing at least two and possibly more wholesalers between the mine and the consumer. Six per cent were bought by the reporting wholesaler from a producer and sold to a wholesaler, thus interposing at least two wholesalers, and 2 per cent were bought by the reporting wholesaler from a wholesaler and sold to a wholesaler, thus interposing at least three wholesalers between the mine and the consumer. Thus 40 per cent of the carloads of domestic sizes reported were handled by two or more wholesalers."

Chemical Engineers Preparing Program

The tentative program for the sixteenth annual meeting of the American Institute of Chemical Engineers, which will be held in Washington, Dec. 5, 6 and 7, has been drawn up. As the auditoriums at the various bureaus are not large enough to accommodate all those who will be in attendance at the meeting, it has been decided that all sessions will be at the Willard Hotel. This will in no way interfere with the plan to make tours of the bureaus in which chemists are particularly interested. The tentative program includes a paper on "Combustion of Coke, a Typical Bureau of Mines Problem of Importance to the Chemical Engineer," by A. C. Fieldner; one on "Testing of Explosives for Governmental and Commercial Use," by J. W. Paul, and one on "Fuel Research of the Bureau of Mines," by O. P. Hood, as well as addresses by Dr. George Otis Smith, director of the Geological Survey; H. Foster Bain, chief of the Bureau of Mines, and others.

German Export of Coal Crippled by Loss of Upper Silesia

Exports of coal and coke from Germany, according to reports of the German Bureau of Statistics, during the first half of this year, in comparison with the corresponding months of 1922 and 1913, are shown in the following table, in metric tons:

	1923	1922	1913
Bituminous coal.....	556,080	4,243,620	16,368,690
Brown coal.....	785	9,170	3,592,911
Coke.....	134,595	558,324	3,405,202

The decline in exports of bituminous coal is accounted for by the partition of Upper Silesia from Germany to Poland. Holland as the only remaining large buyer of

German coal received from January to June, 1923, 448,000 tons out of the total of 556,000 tons of bituminous coal exported. Smaller quantities were shipped to Switzerland, Austria and Czechoslovakia.

Leading Engineers Attend Mine, Mechanical And Electrical Engineers' Meeting

Members of the West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers met for their third annual convention at Huntington, W. Va., Oct. 19 and 20.

The meeting this year was the largest held by the association, many new members having been added within the last year. Papers were presented on several of the vital questions on mine application of electrical and mechanical engineering. The papers were discussed by prominent mine electrical engineers of the country, many of whom have been attracted to the society by the important work it has accomplished within the short time it has been in existence.

Two of the papers presented at the convention appeared in the Oct. 18 issue of *Coal Age*, and another appears in this issue.

Considerable discussion took place on the following papers: "Hoisting Equipment," by M. A. Maxwell; "Equipment Records," by J. H. Edwards, and "Manufacturer's Service in Supplying Repair Parts," by F. M. Reigher. Deep interest was taken in an informal discussion on the subject of Motor-Generator Sets vs. Rotary Converters for Mine Service. This question was ably discussed from many angles by leading representatives of the mining manufacturing, consulting and power companies' engineers.

The convention was concluded with the election of new officers and a dinner. R. R. Webster, of the Elkhorn Piney Coal Mining Co., of Weeksbury, Ky., was elected president; F. M. Reigher, electrical engineer, American Coal Co., of Bluefield, W. Va., vice-president, and Herbert Smith, of Huntington, W. Va., was re-elected secretary-treasurer.

Cement Output and Shipments Drop

Production of portland cement during September, 1923, according to the Geological Survey, totaled 13,109,000 barrels, as compared with 11,424,000 barrels in the corresponding month of 1922, and 12,967,000 barrels in August, 1923. Shipments for the month were 13,698,000 barrels as compared with 12,444,000 barrels in September, 1922, and 13,971,000 barrels in August, 1923. Stocks at the end of September amounted to 5,492,000 barrels, as compared with 4,724,000 in September, 1922, and 6,080,000 barrels in August of this year.

REMARKABLE EXAMPLES of human endurance and perseverance are recorded in connection with the flooding of the Redding coal mine near Glasgow, Scotland. Five men were rescued alive after 214 hours imprisonment. None of the men was the worse for his nine-day fast. The incident parallels the rescue of five Welsh miners after nine days imprisonment in 1877 in a Rhondda Valley coal mine. While the men in the Scottish mine had no food, they were trapped in a part of the men where potable water was available, and where fresh air could be had. Great credit is being given the rescuers for the tireless, night-and-day effort they made to reach the entombed men.

FRED R. LOW, editor of *Power*, has been elected president of the American Society of Mechanical Engineers for the coming year. He will succeed John L. Harrington, of Kansas City, Mo. The election was conducted from the national headquarters of the society, in New York City, by mail ballot, more than 18,000 members participating.

REHEARING OF THE ASSIGNED-CAR CASE began in Washington Oct. 22 before Commissioner Aitchison and William Bartel, director of service of the Interstate Commerce Commission. The first day was devoted to testimony by the railroads, which argued for retention of the assigned-car rule as necessary to obtain adequate supplies of fuel for their requirements.

Soft-Coal Industry to Demonstrate That It Can Improve Its Own Practices

Bituminous Operators' Special Committee Will Make Close Study of Findings of Coal Commission and Voluntarily Put Into Effect Practical Suggestions—To Publish Figures on Costs, Earnings and Wages

BY PAUL WOOTON
Washington Correspondent of *Coal Age*

The Bituminous Operators' Special Committee, which now has become a permanent institution, is going to take full advantage of the interim prior to the convening of Congress to demonstrate that the industry is capable of improving its own practices. It is in no way an admission on the part of the operators of any outstanding and flagrant delinquencies on their part. If they can be rid of strikes and governmental interference, they point out, the country will be supplied with all the coal that it can use at reasonable prices. Nevertheless it is recognized that a public demand exists for basic figures and these are going to be furnished on a voluntary basis. Mr. Brydon was in Washington last week, conferring with government officials.

A detailed study is being made of the reports of the Harding Coal Commission, with the idea of carrying into effect voluntarily any practical suggestion made by the Commission. This is subject, of course, to the committee's ability to finance the work involved. Incidentally it may be mentioned that the matter of financing such activities is becoming increasingly difficult in the period when a considerable portion of the tonnage is being sold with little or no margin of profit.

In view of the fact that the committee has enjoyed only a week of life under its new status, plans have not advanced very far. At this time all activities are being concentrated on plans for publishing figures on costs, earnings and wages. If this movement has the support of operators generally it may head off legislation providing compulsory returns to the Interstate Commerce Commission.

If the plan is successful it must furnish the information in which the public is most interested. It happens that the fields in which the public has the greatest interest are those less likely to make voluntary returns.

WAGE RETURNS A SUBJECT OF WIDESPREAD INTEREST

Returns on wages would seem to be among the more important things which the operators could do in their own interest. This is particularly true of wages paid in the non-union fields. If it could be brought home to the public that earnings of \$500 per month on the part of an individual coal miner is not the exceptional performance of an exceptional man and that literally scores of men earn that much, the public might make its influence felt when the men come forward with requests for an increase of 15 or 20 per cent, as they probably will do next spring. While the public is fairly familiar with the wage rates in the union field, there is much opportunity to point out to them just how this wage scale works out. There is comparatively little knowledge of wage rates in the non-union fields and since they change frequently there is greater need for basic information concerning them.

Perhaps this is a good time for the Bituminous Operators' Special Committee or the National Coal Association as such to enter upon the consideration of technical matters. Practically every other large national association undertakes work of that character. The need is greater in coal mining than in nearly any other industry. None disputes that coal-mining properties are poorly managed from an engineering standpoint. There are great wastes which could be eliminated and it even might be to the interest of the industry were the national association to undertake to instruct consumers how to get the most out of their coal rather than have them convert their power plants to use oil.

Since the public is demanding more than the figures which operators can furnish it might be advisable for the National, as the most powerful association within the industry, to take the initiative in formulating a program in which the wholesalers and retailers would participate.

In the whole gamut of questions arising in industrial relations, other than wages and hours, a fertile field is offered to the National Coal Association. The opportunity for doing something constructive in the matter of housing alone is great.

Statistics covering production, distribution and stocks are inadequate. There is no thought that this activity should not remain where it is, in the Geological Survey. The service should be expanded, particularly in regard to distribution of stocks. The only way that can be done is to bring the need forcibly before Congress so that the necessary funds may be appropriated.

STILL MUCH ROOM FOR IMPROVEMENT

This does not pretend to be a full list of the many things which the industry can do to improve itself. There are literally thousands of things, statistical and otherwise, which would contribute in no small way to the industry's improvement. A golden opportunity exists to demonstrate, prior to the convening of Congress, what can be done in the public interest and in the interest of all branches of the coal trade.

The question may be asked as to the probability of the acceptance by the public of data put out by an interested source. All that is necessary to answer such a question is to point to the American Iron and Steel Institute, the American Railway Association, the National Lumber Manufacturers' Association or any one of many other organizations. Their figures are accepted by the public at their face value. No one thinks of questioning the figures covering the production of steel ingots. Financial operations of great magnitude are influenced by the Iron and Steel Institute's figures on unfilled orders. The National Lumber Manufacturers' Association gathers by telegraph each week and distributes at great expense figures as to lumber productions, shipments and orders. Business accepts them and so does the public. They would be willing to repose the same confidence in the National Coal Association. The coal operators filed good briefs with the Coal Commission. They now have an opportunity, and it may head off adverse legislation if they demonstrate their ability to do voluntarily some of the things which otherwise might be made a legal obligation.

Government Fuel Yard Seeks Coal Bids

The Government Fuel Yard, Washington, D. C., seeks the submission of bids on 14,700 gross tons of low-volatile bituminous run-of-mine coal to cover its fuel requirements for the period from Nov. 15 to March 31, next. The tonnage called for is for use in plants located on the Baltimore & Ohio R.R. only. "A consideration of freight rates limits, therefore," it is announced, "bids on this tonnage to coal from mines on the B. & O. or connecting lines." Sealed proposals to supply the tonnage will be received by George S. Pope, Chief Engineer, Government Fuel Yard, Room 1139, Interior Department, up to 2 p.m. Oct. 31 and then publicly opened.



Production and the Market

Weekly Review

The soft-coal market continues to show practically the same conditions that have prevailed for several weeks. Demand continues slow. Production took a slight upturn but a decline is indicated for last week. Steam coals are moving slowly, while domestic coals show a slightly better demand in some parts. The railroads are reported by the American Railway Association to hold 17,663,448 tons of bituminous coal, of which 15,605,415 tons is in stockpiles and 2,058,033 tons is in cars. This total compares with 16,365,693 tons in reserve on Sept. 1 and 6,756,886 tons on Jan. 1. Spot prices in some districts show a slight advance but these are almost offset by declines in others.

Coal Age Index for the first time in seven weeks shows an advance, registering 186 on Oct. 22, an increase of one point from the previous week, with an average price of \$2.25. Increases in southern Illinois, Springfield, Standard and Kanawha coals were practically offset by declines in eastern and western Kentucky, Clearfield, Cambria, Somerset and Pocahontas fields.

Production of soft coal during the week ended Oct. 13 is estimated by the Geological Survey at 10,771,000 net tons, an increase of 71,000 tons over the previous week, but an appreciable decrease is indicated for last week.

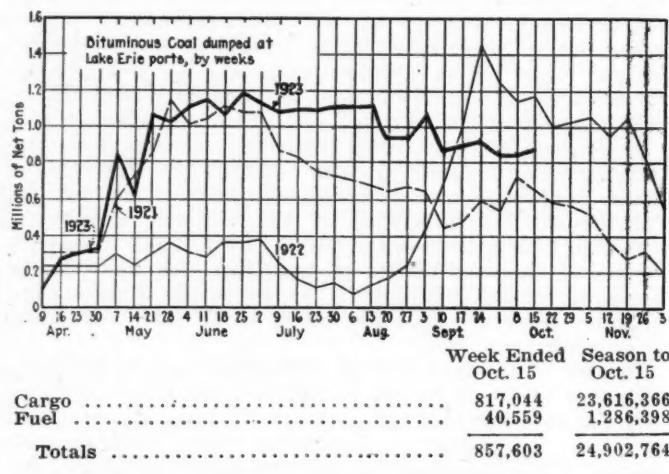
CONSUMERS RELUCTANT TO BUY

Market dullness is reported in nearly all sections. Consumers are reluctant to buy, as they are well stocked. A slight improvement in spot buying is reported from the Middle West, particularly for domestic coals, due to slightly lower temperatures, while domestic business in St. Louis is tied up because of mild weather, and there is no demand for anthracite, coke or smokeless coal. The Kentucky markets are in bad shape, while the situation in the Northwest is not at all satisfactory.

The Ohio markets are quiet, with no change reported

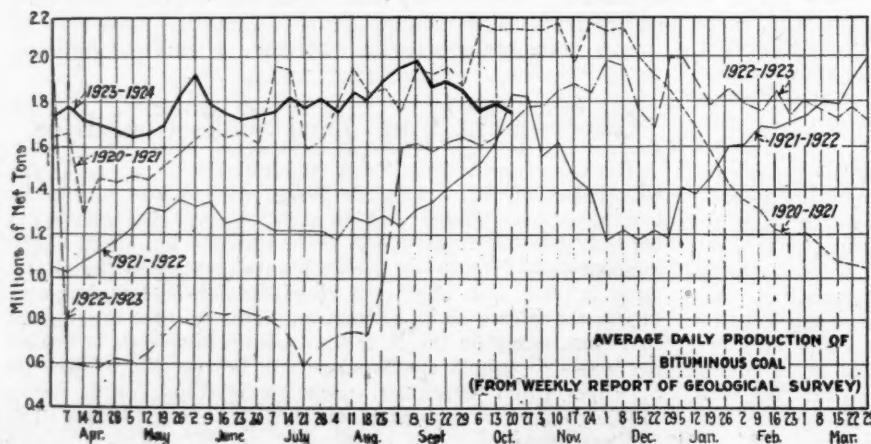
from the Pittsburgh field. Dullness in the textile industry, with heavy reserve stocks of coal on hand continue to dominate the New England situation. Prices are at low levels.

Production of anthracite for the week ended Oct. 13 amounted to 2,009,000 net tons, according to the report of the Geological Survey. In the previous week it was 2,015,000 tons, which was a drop of 10,000 tons from



the week of Sept. 29. Final returns of anthracite shipments in September place the total output for that month at 2,917,000 tons, which was 5,951,000 tons less than production in August, the loss being attributed to the miner's strike. Despite this loss of production during the strike, however, the cumulative output during the first nine months of 1923 compares favorable with that in years of large production. Domestic coals continue in heavy demand, while steam coals move slowly.

All-rail shipments of bituminous coal into New England during the period April 7-Sept. 29 amounted to



Estimates of Production

(Net Tons)

BITUMINOUS

	1922	1923
Sept. 29	9,822,000	11,347,000
Oct. 6 (a)	9,736,000	10,700,000
Oct. 13 (b)	10,110,000	10,771,000
Daily average	1,685,000	1,795,000
Calendar year	290,861,000	434,945,000
Daily av. cal. year	1,198,000	1,795,000

ANTHRACITE

	1922	1923
Sept. 29	1,982,000	2,025,000
Oct. 6	1,994,000	2,015,000
Oct. 13	2,112,000	2,009,000

COKE

	1922	1923
Oct. 6 (b)	173,000	313,000
Oct. 13 (a)	185,000	284,000
Calendar year	5,144,000	15,099,000

(a) Subject to revision. (b) Revised from last report.

111,497 cars, according to a survey of the coal industry issued by F. R. Wadleigh, Chief, Coal Division, Department of Commerce. During the corresponding periods of 1922 and 1921 the shipments were 28,601 and 73,100 cars, respectively. All-rail shipments of anthracite into the same territory during the same period were 83,273 cars in 1923, 17,801 cars in 1922 and 82,081 cars in 1921. During the five months April-August bituminous coal dumped into vessels at North Atlantic ports destined for New England amounted to 5,192,036 tons.

Export demand is slow and the outlook is not encouraging; the German situation is being watched closely.

Midwest Market Improves

A slight strengthening of the market in spots was felt throughout the Middle West during the last two days of last week. Cool weather made an almost imperceptible impression on domestic demand. Even slight changes are

noticeable in a season when the market is as flat as it is now. Southern Illinois lump holds up fairly well to the association circular of \$4.35 with little selling under \$4, but the volume shipped is low. A number of mines are down. It is said in St. Louis that there has never been a time since southern Illinois coal became a factor in that city's market when so little Franklin County coal has been offered there. The southern field has a good many "no bills" in middle-sized coal.

Central Illinois commercial mines also are running slowly so as to avoid "no bills" as much as possible. The best lump produced there holds up above \$3 with a top price of \$3.25. Standard district lump has toned up in price a little. An average increase of about 15c. a ton raises it to \$3@\$3.25. Screenings are not on hand in such huge quantities nowadays. The result is Southern Illinois operators place theirs at \$1.40@\$1.50 and central edges up about 10c. to 85c.@\$1. However, Standard operators suffer a slight lowering on screenings to compensate for their fairly good lump market. The price is 45c.@\$0.50. Western Kentucky screenings are as low, but they do not find eager acceptance. Evidently steam buyers

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

	Market Quoted	Oct. 23 1922	Oct. 8 1923	Oct. 15 1923	Oct. 22 1923†		Market Quoted	Oct. 23 1922	Oct. 8 1923	Oct. 15 1923	Oct. 22 1923†
Low-Volatile, Eastern						Midwest					
Smokeless lump.....	Columbus....	\$7.10	\$6.10	\$6.35	<i>\$6.25@ \$6.50</i>	Franklin, Ill. lump.....	Chicago....	\$5.30	\$4.05	\$4.05	<i>\$3.90@ \$4.35</i>
Smokeless mine run.....	Columbus....	6.25	3.05	3.05	<i>2.85@ 3.25</i>	Franklin, Ill. mine run.....	Chicago....	4.50	2.60	2.60	<i>2.25@ 3.00</i>
Smokeless screenings.....	Columbus....	6.00	2.25	2.25	<i>1.25@ 1.50</i>	Franklin, Ill. screenings.....	Chicago....	3.25	1.25	1.35	<i>1.40@ 1.50</i>
Smokeless lump.....	Chicago....	6.30	6.10	6.10	<i>6.00@ 6.25</i>	Central, Ill. lump.....	Chicago....	5.10	3.10	3.10	<i>3.00@ 3.25</i>
Smokeless mine run.....	Chicago....	6.00	2.85	2.85	<i>2.75@ 3.00</i>	Central, Ill. mine run.....	Chicago....	3.60	2.10	2.10	<i>2.00@ 2.25</i>
Smokeless lump.....	Cincinnati....	6.30	6.10	5.85	<i>5.75@ 6.00</i>	Central, Ill. screenings.....	Chicago....	2.00	.70	.80	<i>.85@ 1.00</i>
Smokeless mine run.....	Cincinnati....	5.55	2.75	2.50	<i>2.00@ 3.00</i>	Ind. 4th Vein lump.....	Chicago....	5.10	3.35	3.35	<i>3.25@ 3.50</i>
Smokeless screenings.....	Cincinnati....	5.30	1.60	1.60	<i>1.25@ 2.25</i>	Ind. 4th Vein mine run.....	Chicago....	4.35	2.60	2.60	<i>2.50@ 2.75</i>
*Smokeless mine run.....	Boston....	7.10	4.80	4.65	<i>4.50@ 4.65</i>	Ind. 4th Vein screenings.....	Chicago....	2.75	1.20	1.20	<i>1.15@ 1.30</i>
Clearfield mine run.....	Boston....	3.75	2.15	2.00	<i>1.50@ 2.40</i>	Ind. 5th Vein lump.....	Chicago....	4.75	2.50	2.50	<i>2.25@ 2.75</i>
Cambridge mine run.....	Boston....	4.25	2.75	2.60	<i>2.00@ 3.00</i>	Ind. 5th Vein mine run.....	Chicago....	3.75	2.10	2.10	<i>2.00@ 2.25</i>
Somerset mine run.....	Boston....	3.95	2.35	2.35	<i>1.75@ 2.75</i>	Ind. 5th Vein screenings.....	Chicago....	2.75	.80	.80	<i>.75@ .90</i>
Pool 1 (Navy Standard).....	New York....	5.00	3.10	3.10	<i>2.85@ 3.25</i>	Mt. Olive lump.....	St. Louis....	.....	3.10	3.10	<i>3.00@ 3.25</i>
Pool 1 (Navy Standard).....	Philadelphia....	.....	3.20	3.15	<i>3.00@ 3.30</i>	Mt. Olive mine run.....	St. Louis....	.....	2.25	2.25	<i>2.20@ 2.30</i>
Pool 1 (Navy Standard).....	Baltimore....	5.00	.....	.....	.....	Mt. Olive screenings.....	St. Louis....	.....	1.25	1.25	<i>1.20@ 1.30</i>
Pool 9 (Super. Low Vol.).....	New York....	4.25	2.35	2.35	<i>2.15@ 2.60</i>	Standard lump.....	St. Louis....	4.35	3.00	3.00	<i>3.00@ 3.25</i>
Pool 9 (Super. Low Vol.).....	Philadelphia....	4.35	2.55	2.45	<i>2.30@ 2.60</i>	Standard mine run.....	St. Louis....	2.75	2.05	2.05	<i>1.80@ 2.30</i>
Pool 9 (Super. Low Vol.).....	Baltimore....	4.35	2.40	2.25	<i>2.15</i>	Standard screenings.....	St. Louis....	2.10	.55	.55	<i>.45@ .60</i>
Pool 9 (Super. Low Vol.).....	New York....	3.85	2.05	2.05	<i>1.90@ 2.25</i>	West Ky. lump.....	Louisville....	5.00	2.55	2.55	<i>2.35@ 2.50</i>
Pool 10 (H.Gr. Low Vol.).....	Philadelphia....	3.60	2.10	2.05	<i>1.85@ 2.15</i>	West Ky. mine run.....	Louisville....	2.45	1.75	1.75	<i>1.60@ 1.85</i>
Pool 10 (H.Gr. Low Vol.).....	Baltimore....	3.90	2.25	2.15	<i>2.10</i>	West Ky. screenings.....	Louisville....	2.10	.55	.55	<i>.45@ .60</i>
Pool 11 (Low Vol.).....	New York....	3.30	1.85	1.85	<i>1.75@ 2.00</i>	West Ky. lump.....	Chicago....	4.10	2.60	2.60	<i>2.50@ 2.75</i>
Pool 11 (Low Vol.).....	Philadelphia....	3.25	1.85	1.75	<i>1.65@ 1.80</i>	West Ky. mine run.....	Chicago....	3.25	1.75	1.75	<i>1.50@ 2.00</i>
Pool 11 (Low Vol.).....	Baltimore....	3.55	2.00	1.80	<i>1.80@ 2.00</i>						

High-Volatile, Eastern

Pool 54-64 (Gas and St.)...	New York....	3.50	1.65	1.65	<i>1.50@ 1.75</i>
Pool 54-64 (Gas and St.)...	Philadelphia....	3.75	1.70	1.65	<i>1.50@ 1.75</i>
Pool 54-64 (Gas and St.)...	Baltimore....	3.60	1.60	1.75	<i>1.75</i>
Pittsburgh sc'd gas.....	Pittsburgh....	5.05	2.55	2.55	<i>2.50@ 2.60</i>
Pittsburgh gas mine run.....	Pittsburgh....	2.20	2.20	2.20	<i>2.20@ 2.30</i>
Pittsburgh mine run (St.).....	Pittsburgh....	3.25	1.85	1.85	<i>1.75@ 2.00</i>
Pittsburgh slack (Gas).....	Pittsburgh....	3.60	1.20	1.20	<i>1.15@ 1.30</i>
Kanawha lump.....	Columbus....	6.25	3.15	3.15	<i>2.85@ 3.50</i>
Kanawha mine run.....	Columbus....	4.50	1.85	1.85	<i>1.75@ 2.00</i>
Kanawha screenings.....	Columbus....	3.75	.95	.95	<i>.80@ 1.00</i>
W. Va. lump.....	Cincinnati....	6.10	3.35	3.35	<i>3.00@ 4.00</i>
W. Va. Gas mine run.....	Cincinnati....	4.35	1.35	1.65	<i>1.25@ 2.00</i>
W. Va. Steam mine run.....	Cincinnati....	3.35	1.35	1.65	<i>1.25@ 2.00</i>
W. Va. screenings.....	Cincinnati....	3.65	.85	.80	<i>.75@ 1.25</i>
Hocking lump.....	Columbus....	5.25	3.10	3.05	<i>2.85@ 3.25</i>
Hocking mine run.....	Columbus....	3.50	1.85	1.85	<i>1.75@ 2.00</i>
Hocking screenings.....	Columbus....	3.25	.95	.95	<i>.80@ 1.00</i>
Pitts. No. 8 lump.....	Cleveland....	3.81	2.60	2.55	<i>2.20@ 3.00</i>
Pitts. No. 8 mine run.....	Cleveland....	3.56	1.95	1.90	<i>1.80@ 1.90</i>
Pitts. No. 8 screenings....	Cleveland....	3.25	1.10	1.05	<i>.90@ 1.10</i>

South and Southwest

Big Seam lump.....	Birmingham....	3.95	3.75	3.75	<i>3.65@ 3.90</i>
Big Seam mine run.....	Birmingham....	2.60	1.95	1.95	<i>1.75@ 2.15</i>
Big Seam (washed).....	Birmingham....	2.75	2.35	2.35	<i>2.25@ 2.50</i>
S. E. Ky. lump.....	Chicago....	5.50	3.35	3.35	<i>2.75@ 3.25</i>
S. E. Ky. mine run.....	Chicago....	4.25	2.25	2.25	<i>2.00@ 2.50</i>
S. E. Ky. lump.....	Louisville....	6.50	3.25	3.10	<i>2.75@ 3.25</i>
S. E. Ky. mine run.....	Louisville....	3.85	2.00	2.00	<i>1.50@ 2.00</i>
S. E. Ky. screenings.....	Louisville....	4.10	.85	.85	<i>.70@ .85</i>
S. E. Ky. lump.....	Cincinnati....	6.75	3.25	3.10	<i>3.25@ 4.00</i>
S. E. Ky. mine run.....	Cincinnati....	3.85	1.35	1.55	<i>1.25@ 1.85</i>
S. E. Ky. screenings.....	Cincinnati....	3.60	.85	.80	<i>.60@ 1.25</i>
Kansas lump.....	Kansas City....	5.75	5.00	5.00	<i>5.00</i>
Kansas mine run.....	Kansas City....	3.75	3.50	3.50	<i>3.50</i>
Kansas screenings.....	Kansas City....	2.50	2.25	2.25	<i>2.25</i>

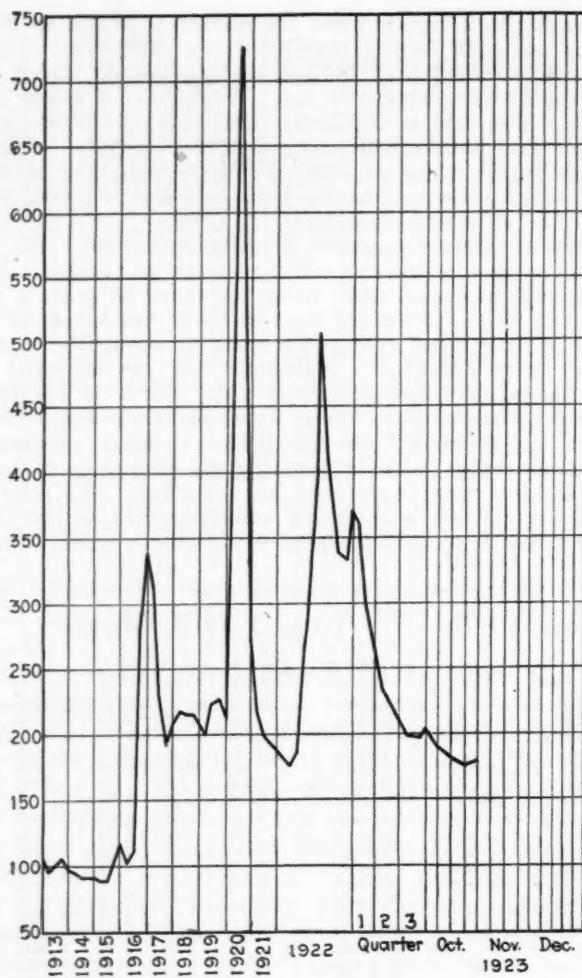
* Gross tons, f.o.b. vessel, Hampton Roads.

† Advances over previous week shown in heavy type, declines in italics.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Dec. 26, 1922	Oct. 15, 1923	Oct. 22, 1923†
			Independent Company	Independent Company	Independent Company
Broken.....	New York....	\$2.34	\$9.00	\$7.75@ \$8.25	\$8.00@ \$9.25
Broken.....	Philadelphia....	2.39	7.90@ 8.10	8.75@ 9.25	8.75@ 9.25
Egg.....	New York....	2.34	9.25@ 12.00	8.00@ 8.35	8.75@ 12.20
Egg.....	Philadelphia....	2.39	9.25@ 11.00	8.10@ 8.35	8.75@ 9.25
Egg.....	Chicago*	5.06	12.50@ 13.00	7.20@ 8.25	9.60@ 12.50
Stove.....	New York....	2.34	9.25@ 12.00	8.00@ 8.35	8.75@ 12.25
Stove.....	Philadelphia....	2.39	9.25@ 11.00	8.15@ 8.35	8.75@ 12.20
Stove.....	Chicago*	5.06	12.50@ 13.00	7.35@ 8.25	9.60@ 12.50
Chestnut.....	New York....	2.34	9.25@ 12.00	8.00@ 8.35	8.75@ 12.25
Chestnut.....	Philadelphia....	2.39	9.25@ 11.00	8.15@ 8.35	8.75@ 12.25
Chestnut.....	Chicago*	5.06	12.50@ 13.00	7.35@ 8.35	9.60@ 12.50
Ranges.....	New York....	2.34	.....	8.25	9.00
Pea.....	New York....	2.22	7.00@ 11.00	6.15@ 6.30	6.75@ 8.25
Pea.....	Philadelphia....	2.14	7.00@ 8.00	6.15@ 6.20	6.75@ 6.60
Pea.....	Chicago*	4.79	7.00@ 8.00	5.49@ 6.03	6.00@ 6.75
Buckwheat No. 1.....	New York....	2.22	4.00@ 5.00	4.00@ 4.10	5.40@ 6.05
Buckwheat No. 1.....	Philadelphia....	2.14	5.00	4.00	6.00@ 6.75
Rice.....	New York....	2.22	3.00@ 3.25	2.75@ 3.00	2.00@ 2.50
Rice.....	Philadelphia....	2.14	2.50@ 2.75	2.75@ 3.00	2.00@ 2.50
Barley.....	New York....	2.22	1.75@ 2.00	1.50@ 1.50	1.50
Barley.....	Philadelphia....	2.14	1.00@ 1.75	2.00	1.25@ 1.50
Birdseye.....	New York....	2.22	.....	2.10	1.60

* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.



Coal Age Index of Spot Prices Bituminous Coal F.O.B. Mines

	Oct. 22	Oct. 15	Oct. 8	Oct. 23	1922
Index	186	185	190	352	
Weighted average price	\$2.25	\$2.24	\$2.30	\$4.26	

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913, 1918," published by the Geological Survey and the War Industries Board.

feel they can afford to wait for another slump in higher grade screenings.

St. Louis Remains Dull

Mild weather continues to tie up domestic business in St. Louis and while a little is moving it is in small quantities and of the cheaper grades. Dealers have their yards full and reports show that there is no demand for anthracite, smokeless or coke. Country domestic calls show that the demand is mostly for middle-priced coals and almost universally the lump size in spite of efforts on the part of shippers to move egg and nut.

Wagonload steam has picked up during the last few days on account of wet weather, but carload is still lagging, with no country call at all and practically nothing moving to the Northwestern or Chicago markets. Railroad tonnage also has dropped off.

The Kentucky coal market is in poor shape. While a considerable amount of tonnage is being moved, it is not on a profitable basis for the operator or the jobber. Some operators selling direct are quoting prices which the jobber can meet only by cutting his commission down to practically nothing. There is too much coal being offered for the market to absorb. Retailers in some instances have fair yard stocks, but others are buying merely as they need coal, and playing for a lower market later in the fall.

Some ridiculously low prices have been reported in the local market during the week. A jobber reported inability to sell a car of Elkhorn mine-run, representing distress fuel, at 85c. Some good mine-run has been quoted as low as \$1.25 from eastern Kentucky. Harlan County is asking \$2@\$2.25 for gas mine-run, but jobbers report that it is being offered at \$1.50 and up by some mines, and the situation in the Hazard field is much the same.

Northwestern Trade Still Sluggish

The warmth of the past week was sufficient to keep the Northwestern coal trade in the dumps. A decline in domestic demand in Duluth did not cause much worry, however, for dealers were confident that the colder weather promised for this week would snap things up. They are laying in all the anthracite they can handle. However, movement of both hard and soft coal to the upper lake docks was small during the week. Only thirty-one cargoes reached the Head-of-the-Lakes, of which but two were of anthracite. At Duluth prices held firm, in spite of slack trade, on everything but Kentucky, splint and Pocahontas screenings. These coals are off because of excess supply and because dock owners want to unload them before a freeze-up.

"No demand; little doing," is the laconic market opinion in Milwaukee. The recent 70c.@80c. advance in hard coal has damped out all keenness in demand for anthracite and even the low prices at which Pocahontas, as a hard-coal substitute, is offered has not stimulated buying much. Docks appear to be trying to get all the hard coal they can, however.

Milwaukee receipts during the first half of October aggregated 79,986 tons, making the season's receipts of hard coal since the opening of navigation 713,625 tons. October receipts of soft coal thus far total 233,772 tons, making the season's receipts 2,319,121 tons. These figures bring the total receipts of both hard and soft coal since navigation opened up to 3,032,746 tons.

Trade at Minneapolis has been low. The market on soft coals has steadied somewhat as the vast excess of coal available a couple of weeks ago thinned out a little, but nobody is buying in quantity and competition continues sharp. Hard coal has moved readily enough into the country but the cities still are partly unsupplied and will have to buy at the new increased price since pre-strike coal is exhausted.

West Does Little

There is little to relieve the drabness of the market condition in the West and Southwest. Around Kansas City steam demand continues light and screenings continue to back up on the mines. Demand for domestic sizes of both Arkansas smokeless and Kansas coals is fair. In Colorado demand is so small that nothing moves readily and mine running time has fallen off still further. The September output was 863,500 tons, which was 26,400 tons under September of 1922.

In Utah the little flurry of trade brought on by the recent changes in price lists has about blown over and business is slowing up. A car shortage is making itself felt. While the Pacific coast and Northwestern markets remain dull, Utah and Idaho are taking a good deal of domestic coal. Steam demand seems to be off.

Ohio Market Sluggish

Rejections, coal on commission, coal in distress and a demand that is even more sluggish than draggy are the high lights in the Cincinnati market. There is a certain amount of firmness in the domestic coal market. Southeastern Kentucky mines and the smaller operations on the Big Sandy are beginning to feel the pinch of high costs and low returns and there are a number of the mines there that have closed down or are contemplating doing so as a means of stopping their losses. There has been no great change in the low-volatile situation except that some brokers are offering smokeless lump and egg now at \$6. Retail prices are unchanged.

Warm weather together with heavy stocks on the part of steam-coal users has tended to reduce demand in the Columbus market. Little hope is held out for the present.

Retail dealers are buying for immediate needs generally and some of them have some demand for Pocahontas and other smokeless grades, but the majority are delivering only a small tonnage. Ohio-mined coals are not selling as well as formerly for domestic purposes although some tonnage is moving both from the Hocking Valley and Pomeroy Bend fields. Purchasing agents are showing no interest in the steam-coal situation. Reserves are sufficient for from sixty to ninety days and at present utilities are the best customers, with the railroads taking a fair-sized tonnage. Screenings are the weakest, with prices low.

The Cleveland market is in the doldrums, operators and jobbers asserting that it is duller now than for many years. Distress coal continues to move into industrial centers, with the result that in many instances sales of this coal are made from 10c. to 15c. per ton below what might be considered the spot range. Public utilities are not storing as much coal this fall as they have in the past.

The Pittsburgh coal market does not seem to have lost any more ground last week, but it has not improved either. Consumption is large, but consumers are not in the market to any extent, being supplied either by regular contracts or by arrangements whereby prices are adjusted or agreed upon weekly or monthly. The open market demand for coal is very light and there are no indications at present that it will improve. The market for Pittsburgh district coals is disturbed also by the greater competition of non-union fields, the low prices quoted for some of this product having an influence on the market.

In order to keep their mines in operation it is reported that coal operators in the central Pennsylvania district are loading cars and holding them on the sidings. The daily loadings in September averaged 3,101 cars as compared with 3,200 cars in August, while the daily loadings during the first fourteen days of October averaged 2,842 cars.

No Improvement in New England

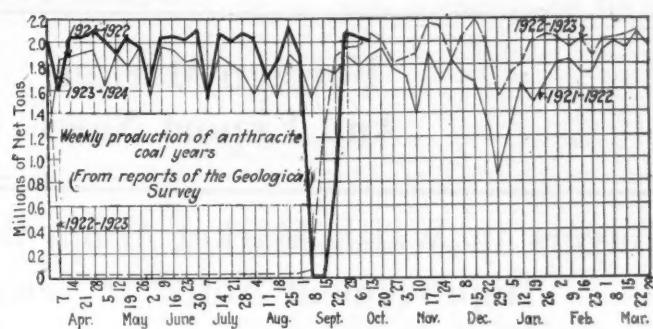
In New England the steam trade is still very much in the doldrums. Prices are at low levels whether all rail or by water and there are no signs of improvement. The textile industry is still under heavy restriction and those mills that still use coal have large stocks that will meet probable requirements for months to come.

At Hampton Roads there continue large accumulations and quotations have eased off to \$4.50 per gross ton f.o.b. vessel for No. 1 navy standard grades. On cars at Boston and Providence sales have been made at as low as \$5.75 per gross ton and there are still cargoes afloat that factors are trying to force on the market.

Receipts all-rail have diminished materially. Even the railroads are taking less tonnage than was the case during August and September. All the agencies are combing over consuming territory, but their efforts meet with only light response. What scattering purchases are made are of coals from low-cost mines where operators have scaled quotations down to a minimum.

Little Change in Atlantic Seaboard Markets

There is no appreciable change in the soft-coal markets along the Atlantic seaboard. At New York demand is light and prices easy. Spot coal moves slowly. In the



Philadelphia market nothing has developed to encourage the producer and the situation last week was quieter than during the previous week. Changed weather conditions, it is believed, will be necessary before there is a change in the situation. The Baltimore market is usually flat and prices are low. Although there is not much demand for either high- or low-volatile coals, says a report from West Virginia, there has been no appreciable reduction in the output. "No market" losses in the Virginia territory are not so heavy.

The market at Birmingham is weak and featured by the smallest volume of new business so far recorded this year. No interest is being shown by buyers beyond obtaining immediate requirements, and these are either very small or are taken care of by reserve stocks. The domestic market, which has held up satisfactorily until recently, is now sluggish. The small amount of new business offered is placed in many instances with the smaller producers at somewhat shaded figures. Furnace mines are operating three to five days a week and commercial mines with few exceptions not over three days.

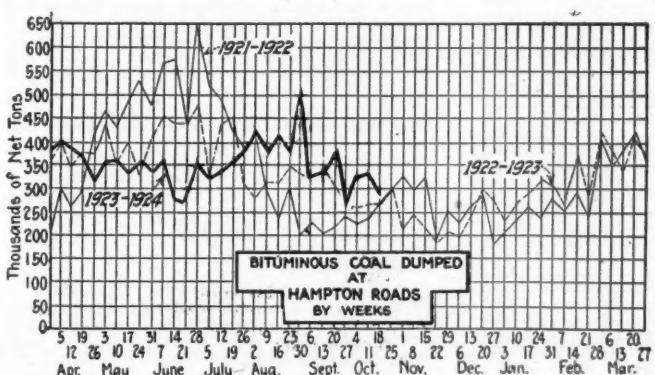
Movement of soft coal through the lower Lake ports amounted to 857,603 net tons during the week ended Oct. 14, an increase of 19,093 tons when compared with the previous week. Lake shipments of anthracite during the second week in October totaled 125,610 net tons, and were confined to Buffalo, there being no shipments through Erie. Cumulative shipments of anthracite in 1923 amount to 2,633,909 tons.

Domestic Anthracite Market Brisk

The anthracite market for domestic coals continues brisk, but the steam sizes are moving slowly. Most retail dealers are anxious for heavier shipments of the larger coals, particularly stove. In the territory served by the New York market strong efforts are necessary to move steam coals and some producers and shippers are offering inducements to buyers. Most of the larger companies find it necessary to store these coals because of the small demand. There is no appreciable change in the Philadelphia market, most dealers continuing to be short of the most-wanted coals. Consumers persist in their preference for stove and chestnut sizes, the latter size being in stronger demand than the former. The steam coals are draggy, with the companies making strong efforts to dispose of these coals. The arrival of 631 cars of anthracite at Baltimore during the first two weeks in October resulted in easier conditions there and enabled the retail dealers to catch up with their orders.

Production of beehive coke continues downward, says the Geological Survey, reports for the week ended Oct. 13 showing an estimated output of 284,000 net tons as compared with 312,000 tons during the previous week.

Car Loadings, Surpluses and Shortages



	Cars Loaded—	Surplus Cars—	Car Shortage—
	All Cars	Coal Cars	
Week ended Oct. 6, 1923.....	1,079,690	191,741	
Previous week.....	1,097,274	200,970	
Same week in 1922.....	953,952	185,774	
	Oct. 7, 1923.....	34,138	16,160
	Same date in 1922.....	5,500	4,600
	Sept. 29, 1923.....	41,745	5,651
		7,098	15,331
		3,024	5,439

Foreign Market And Export News

Buyers in Welsh Market Adopt Bear Tactics; Improvement Noted at Newcastle

Production of coal in Great Britain's mines during the week ended Oct. 6 amounted to 5,528,000 tons, says a cable to *Coal Age*. This is a decline of 47,000 tons from the previous week, but an increase of 319,000 tons when compared with the output of the corresponding week of last year.

The condition of the Welsh coal market is little if any better than a week ago. Business is mainly of a hand-to-mouth character and demands are being met from the accumulated stocks. Buyers, in hope of improvements in reparation deliveries, are adopting bear tactics and operators are forced to sell at cut prices. Purchases are being kept to the minimum and the outlook for the future is causing nervousness among consumers. Operators refuse to sell for future delivery on the basis of current prices.

The Newcastle market has improved. Prices have changed very little, but the undertone is stronger and operators are more confident. Inquiries have expanded, are more varied and practically all classes of coal are selling well. Business with Germany, France and the Baltic has increased. It is anticipated that in the event of a settlement of the Ruhr problem, French purchases will diminish but that Germany must buy British coal for some months to come.

There is something of the nature of a slump in the Swansea anthracite market.

Tax Lifting Results in Lower Prices

The United States Department of Commerce at Washington has received a cablegram from Commercial Attaché Herring at Berlin stating that the abandonment of 30 per cent coal tax and further price reductions by from 10 to 15 per cent became effective Oct. 15, resulting in the following reduced prices in gold marks per metric ton: Ruhr pitcoal 24.92; Westphalian nut 33.78; Silesian lumps 19; Rhenish lignite briquets 15.15. This was due to violent protests on the part of the industry and the general public against the former prohibitive prices.

Export Clearances, Week Ended

Oct. 20, 1923

FROM BALTIMORE

	Tons
Br. SS. Eskbridge	5,989
For Cuba:	
Nor. SS. Krospond	3,357

FROM HAMPTON ROADS

	Tons
For Cuba:	
Amer. Schr. Commark, for Cienfuegos	1,790
For West Indies:	
Br. Schr. Ada A. McIntyre, for St. Stephens	763
For France:	
Fr. SS. Mecanicien, for Marseilles	5,958
For Canada:	
Fr. SS. Therese Horn, for Three Rivers	5,819
For Virgin Islands:	
Nor. SS. Halse, for St. Thomas	3,164
For Brazil:	
Br. SS. Jeseric, for Rio de Janeiro	6,465
For Italy:	
Ital. SS. Emanuele Acearne, for Port Ferrajo	11,262
For Hawaiian Islands:	
Amer. SS. Orleans, for Pearl Harbor	9,133
For Jamaica:	
Swed. SS. Adolph, for Kingston	2,931

FROM PHILADELPHIA

	Tons
For Cuba:	
Am. Schr. Else, for Humacao
For Canada:	
Br. Schr. Cutty Sark, for St. John's	
Br. SS. Clan Macbrayne, for St. John's
Br. Schr. Harry A. McLennan, for St. John's

French Coal Output Increasing

With coal production in France increasing, receipts of German, Belgian and British coals are decreasing. Demand for house coals is comparatively quiet at present, but expectations are that this market will soon revive. The Belgian export decree is said to be interfering considerably with receipts of Belgian coals by France and also the execution of private contracts which have been closed. On the other hand business terms with Great Britain are easier and small price concessions are being made for prompt delivery. A shortage of rolling stock is reported in both France and Belgium.

Coke receipts by the S.C.O.F. during September amounted to 135,000 tons, an increase of 30,000 tons over August shipments, while perequation price for October has been fixed at 212 fr., as

compared with 200 fr. in September. Every possible effort is being made by metallurgists to increase the production of coke. Cokeries destroyed during the war are being rebuilt and new cokeries are being constructed in various parts.

During August production of coal and lignite amounted to 3,405,028 metric tons, as compared with 3,214,814 tons in July, while during the same month coke production was 180,860 tons as compared with 178,427 tons in July.

Ruhr Coal Shipped to Italy

Shipments of reparation coal from the Ruhr to Italy during the past five years follow: 1919, 114,000 tons; 1920, 1,330,400 tons; 1921, 2,765,200 tons; 1922, 2,480,000 tons, and 1923, 850,000 tons.

Movement at Hampton Roads Below Normal

Business at Hampton Roads was dull last week, with the bunker trade showing the only activity. Coastwise shipments were not holding up to the record, while export business moved on a very slender schedule.

Movement at the piers was below normal, and the market was weak. Prices were at a low level, but buyers were not tempted to any great degree. Coal dumpings were considerably below the activity at the same period last year.

Shippers were not optimistic over the foreign trade situation, and did not look forward to any great movement of coal abroad.

Hampton Roads Pier Situation

	Oct. 11	Oct. 18
Cars on hand	1,194	1,132
Tons on hand	67,277	70,531
Tons dumped for week	113,677	99,790
Tonnage waiting	1,900	500

	Oct. 11	Oct. 18
Virginian Ry. piers, Sewalls Pt.:		
Cars on hand	1,761	1,905
Tons on hand	102,350	112,450
Tons dumped for week	110,814	75,274
Tonnage waiting	10,100	3,900

	Oct. 11	Oct. 18
C. & O. piers, Newport News:		
Cars on hand	2,120	2,048
Tons on hand	102,500	108,240
Tons dumped for week	78,484	70,342
Tonnage waiting	4,000	15,025

Pier and Bunker Prices, Gross Tons

	PIERS	BUNKERS
	Oct. 13	Oct. 20†
Pool 9, New York	\$4.95@ \$5.35	\$4.90@ \$5.25
Pool 10, New York	4.50@ 4.90	4.35@ 4.75
Pool 11, New York	4.25@ 4.60	4.00@ 4.50
Pool 9, Philadelphia	5.30@ 5.50	5.30@ 5.50
Pool 10, Philadelphia	4.50@ 5.05	4.45@ 5.00
Pool 11, Philadelphia	4.25@ 4.60	4.20@ 4.55
Pool 1, Hamp. Roads	4.75@ 4.85	4.75@ 4.85
Pool 1, Hamp. Roads	4.30@ 4.40	4.25@ 4.35
Pool 2, Hamp. Roads	4.25@ 4.40	4.50@ 4.60

	PIERS	BUNKERS
	Oct. 13	Oct. 20†
Pool 9, New York	5.25@ 5.65	5.20@ 5.55
Pool 10, New York	4.80@ 5.20	4.65@ 5.05
Pool 11, New York	4.55@ 4.90	4.30@ 4.80
Pool 9, Philadelphia	5.50@ 5.90	5.50@ 5.90
Pool 10, Philadelphia	5.00@ 5.35	4.95@ 5.30
Pool 11, Philadelphia	4.55@ 4.85	4.50@ 4.80
Pool 1, Hamp. Roads	4.75@ 4.85	4.75@ 4.85
Pool 2, Hamp. Roads	4.25@ 4.40	4.50@ 4.60

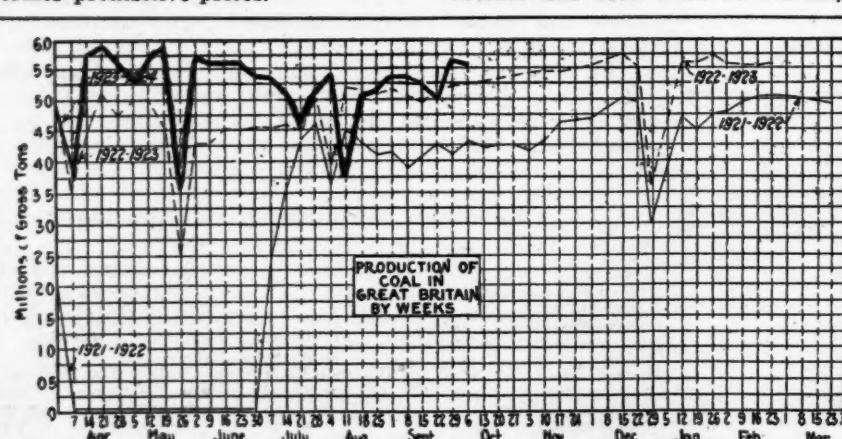
Current Quotations British Coal f.o.b. Port, Gross Tons

	Quotations, by Cable to <i>Coal Age</i>	Oct. 13	Oct. 20†
Admiralty, large....	27s.6d. @ 28s.6d.	27s.6d. @ 28s.6d.	
Steam smalls....	18s. @ 19s.	18s. @ 19s.	

Newcastle:

Best steams.....	24s.6d. @ 25s.	25s.
Best gas.....	24s.6d. @ 25s.	24s.6d. @ 25s.6d.
Best bunkers.....	24s. @ 24s.6d.	23s. @ 24s.6d.

† Advances over previous week shown in heavy type, declines in italics.



News Items From Field and Trade

ALABAMA

Walter Moore, of the Pratt Fuel Co., Birmingham, has closed a deal whereby his company obtains possession of the Red Oak Mine, of the Disney Coal Co., near Cordova, Walker County. The operation formerly belonged to A. R. Disney and is a slope on the Mt. Carmel seam and is served by the Frisco railroad. The mine is electrified, the coal being cut by machine and motor haulage being employed.

The Hercules Coal Mining Co. has been incorporated with a capital stock of \$2,000, with headquarters at Henry Ellen. W. L. Simmons is president; J. J. Lee vice-president, and F. G. Moore, secretary of the company.

The Hercules Powder Co. has acquired about 600 acres of land near Bessemer, Jefferson County, on which it is understood a large, modern plant will be erected. The company is now operating the old plant of the Aetna Explosive Co., which it acquired through sale by a federal receivership several years ago, but on account of growth in its business a larger and more modern plant is made essential.

ARKANSAS

F. O. Sandstrom, secretary and traffic manager of the Colorado and New Mexico Coal Operators Association was in Chicago the week of Oct. 15 with A. Vogl, attorney for the Colorado operators, compiling and filing the brief for the recent Western rate hearing held in Denver.

ILLINOIS

A report current in railroad and coal circles that the Illinois Central R.R. is going to build a line into the Harrisburg field of southern Illinois has been unofficially denied by the railroad, though the denial is not positive and final. If such a line were built it would give the Illinois Central access into a region practically controlled in the past by the Big Four.

The mine of the Star Coal & Mining Co. at Freeburg, in St. Clair County, was sold Monday, Oct. 15, by order of the court at public sale in Belleville to C. A. Gent for \$6,000. The property had been in the hands of D. S. Gent, as receiver.

The game of "freeze out" between the union miners and the owners of No. 3 mine of the Brewerton Coal Co. at Lincoln goes merrily on. The miners struck Sept. 26 because the checkweighman insisted that a housing that had been built around the scale beam obstructed his view. The mine was shut down and has been in process of dismantling. The strike was pulled without official union authorization although Freeman Thompson, subdistrict president, has voiced his sanction of it since in a number of outbursts of publicity directed at the company and its president, W. A. Brewerton. Since the company started pulling rails and equipment out of the mine, giving every indication of abandoning a property that has given almost continuous employment to 200 men all summer, much pressure by the town of Lincoln and others interested has been brought upon both company and miners to settle. The company is able to fill its contracts from its neighboring mines and no settlement has yet been made.

The Odin Coal Co., of Odin, is rebuilding its tipple, recently destroyed by fire, equipping it with modern type screens and shaker booms. Roberts & Schaefer, of Chicago, have the contract.

The Gartside Coal Co.'s mine No. 4 at Murphysboro, in the Big Muddy seam, has been dismantled and practically everything sold, excepting the tipple and hoisting engines and one boiler. Depressed market conditions are responsible. This company is the oldest operating company in the southern Illinois field and possibly in the state of Illinois. Organized in 1843, it has had continued operating existence for 80 years. In the early days they operated a mine in and around St. Louis just west of the Missouri Botanical Garden. For over 30 years the Gartside Coal Co. brought its coal across the Mississippi in wagons on boats before any railroads crossed the river. The company has been an active retailer in St. Louis since 1843.

Stewart S. Shive, president of the Mammoth Coal Co., of Benton, wrote *Coal Age* Oct. 15 that his company has leased from the United Mine Workers of Illinois the strip mine formerly owned by the Southern Illinois Coal Co. and is now operating it. This is the Herrin property around which the 1922 riot centered.

The L. A. Papke Construction Co. is erecting a warehouse at the new town of Nason, in preparation for erecting 100 or more houses, which will be for sale to miners locating in the new town. A new house will be completed every four days. With the completion of the railroad into Nason, building operations at the new mining town are proceeding rapidly.

T. L. Lewis, Charleston, W. Va., representing the National Coal Association, Washington, D. C., was a speaker before the Rotary Club of Quincy, Oct. 16, on the subject "Causes for the High Cost of Coal." Mr. Lewis has been an active worker in the soft coal fields for thirty years.

The J. H. Patterson Co., operating coal and lumber yards in nine towns, will remove its main offices from Marengo to Rockford Nov. 1. Office rooms have been taken in the Phoenix Building, North Main and Mulberry Streets. The company operates yards in Freeport, Rochelle, Marengo, Huntley, Union, Wauconda, Roscoe, Harlan and Rockford.

The Eureka Coal & Dock Co., of Chicago, has increased its capital from \$100,000 to \$300,000.

The Burke Coal Corporation, of Pinckneyville has been incorporated by J. T. Burke, W. A. Lafont and E. C. Dodge with a capital of \$100,000 to mine and sell coal.

Several coal operators in St. Louis, Mo., with mines in the Fifth and Ninth Districts of Illinois have received letters from D. R. Francis & Bro. of St. Louis, asking if their mines are for sale. This would indicate that another effort will be made such as was made about 3 years ago to gather in several of these mines now while the coal market is in a demoralized condition. It would have a stabilizing effect if it could be put through.

Nat McFadden, engineer at Taylorville for the Peabody Coal Co., will act as instructor in the class for preparation for mine managers in the night school for tradesmen conducted by the Taylorville high school. This class will prepare the men who expect to take the state examination as mine managers.

The five men injured when a cage fell 100 ft. in the Decatur Coal Co.'s mine at Decatur will recover. All were painfully and severely bruised, broken bones being especially numerous. The accident was caused by the snapping of a hoisting cable.

Notices have been posted announcing the closing of the Taylor Springs mine of the Indiana & Illinois Coal Corporation near Hillsboro. The mine will be sealed.

INDIANA

Hearing of the case of the J. Woolley Coal Co., of Evansville, against the Southern Railroad Co. asking for damages of \$105,000, has begun before federal examiners for the Interstate Commerce Commission last week. The coal company alleges the railroad discriminated in distributing coal cars last winter. It also is alleged that railroad supplied cars to the company's competitors and that the loss in business because of this alleged discrimination amounted to more than \$105,000. The railroad company denied the allegation, and maintained that in these months there was a shortage in coal cars, due to the shopmen's strike. Evidence submitted will be taken to the Interstate commerce commission at Washington for a decision.

Failure of water supply from a 50-acre lake of the Enos Coal Co., in Pike County, resulted in the company endeavoring to dam a branch of the Patoka River, which would include damming a \$40,000 drainage ditch built by farmers of the adjoining property. The Pike County Commissioners refused permission for the dam when the property owners filed complaint. The company went on cutting timber and getting ready with a big force of men to construct

the dam, when an injunction was filed at Jasper, by Leonard Farmer. It was granted, and the company has been notified of the action, pending a hearing of the case.

Between four and five thousand miners in Indiana are out of work this fall, according to an estimate made Wednesday, Oct. 17 by Carl J. Fletcher, Indianapolis, vice-president of the Knox Coal Mining Co. An overdevelopment of the entire coal industry, combined with large shipments from Eastern non-union fields into Indiana was blamed by Fletcher for the present situation. Most of the miners are finding temporary occupation in other industries, he said.

KENTUCKY

It is reported that the Consolidation Coal Co., in the McRoberts-Jenkins neighborhood, has been working full time in its string of mines and employing night shifts, getting out a heavy tonnage. A good many of the big companies, which have large tonnage in hand, are operating as full as car supply will permit. Business is also heavy in the Harlan and Hazard fields as well as Elkhorn fields, but prices are not satisfactory since steam consumers slowed up on buying screenings.

Charles I. Dawson, Republican nominee for Governor, who is making a stump tour of the state, is plainly denouncing plans for any coal sales or tonnage tax, and pledging his full effort to prevent imposition of any such tax by the next session of the Legislature. Dawson is also panning W. J. Fields, Democratic nominee, for failure to state his position in the coal tax controversy, which promises to be the big issue of the next legislative session.

Three men are dead at Hazard, as a result of a fight in the clubhouse of the Superior Coal Co., No. 4, at Combs just out from Hazard, on Oct. 12, in which Anse Begley, telegraph operator for the Louisville & Nashville R.R., John Baker and his brother, Bob Baker, also died. John Baker lived a few days before succumbing to pistol wounds.

The Ohio River has been at a low stage between Louisville and Pittsburgh for the past few days, and tonnage movements of coal as well as all freights have been light. However, heavy rains over the watershed on Oct. 17 are relieving the situation somewhat.

The Bertha-Consumers Co. has just placed in service three hundred new fifty-five ton, two-door steel hopper railroad cars at its Elsie Mines, Elsiecoal, Ky., on the Louisville & Nashville R.R. The latest improved shaker screen equipment also has been installed at these mines and new houses have been completed to take care of an enlarged working personnel.

The Dixie Gem Consolidated Coal Co., Pineville, Bell County, has increased its capital stock from \$10,000 to \$60,000.

The Kentucky Coke Co., subsidiary of the Louisville Gas & Electric Co., a Byllesby interest, has increased its liability limit from \$500,000 to \$5,000,000. Donald McDonald, Halford Erickson and Matt O'Doherty signed the amendment. The Louisville Gas & Electric Co. interests are installing a new artificial gas plant at Louisville, to start with a capacity of 12,000,000 cu.ft., later to be increased. The company controls its own coal mine at Echoes.

The Fordson Coal Co., operating in eastern Kentucky, has asked an injunction to prevent John Colts O'Rourke and others of Leslie County, from interfering with surveyors who are running lines on the Ford properties. The surveyors were recently forced to break camp and move on by the hillmen. The suit was filed in federal court at Covington, and a temporary injunction granted. Defendants were ordered to appear in London, Ky., Oct. 18, for a hearing of charges.

It is reported from Jenkins that residents of that town, and the towns of McRoberts, Dunham, Burdine and other operating centers of the Consolidation Coal Co., in the Elkhorn fields, have started a fund for erection of a monument to the memory of John G. Smyth, former company manager, who was killed in a slate fall at Penny, where he held an interest in a small mine he was inspecting at the time. Mr. Smyth was founder of the towns named.

The Clearfield Cannel Coal Co., Clearfield, Rowan County, capital \$100,000, has been chartered by Guy Snyder, G. H. Gearheat, Clearfield; and Drew Evans, of Morehead.

The Dawson Daylight Coal Co., Louisville, will develop 1,400 acres of coal property at Dawson Springs, the contemplated daily output to be 1,500 tons.

The S. & W. Coal Co., Sutton, Pike County, capital \$30,000, has been chartered by J. M. Smith, Uniontown, Pa., and Nora

C. and A. C. Walther, of Sutton. The same interests also chartered the Rockledge Development Co., capital \$20,000.

MASSACHUSETTS

The Island Creek Coal Co. reports for the quarter ended Sept. 30 last net income after taxes amounting to \$623,634, against \$713,154 for the same period last year. After preferred dividends the earnings in the third quarter were equivalent to \$4.61 a share on the 118,798 shares of common stock, against \$5.37 in the same quarter last year. For the nine months ended September 30 last, earnings available for the common stock were equal to \$14.80 a share, against \$20.75 a share in the same period of 1922.

MINNESOTA

The investigation of County Attorney Olson, in Minneapolis, into the coal situation continues to afford the daily papers with considerable copy worthy of headlines. He suspects that the allowance by dealers for loss in breakage of anthracite to be too much, and also sees that there is too much unanimity of prices, although there are some differences. The latest thing to command official attention is the price of coke. The officials of the coking plant were summoned to give evidence. It was claimed against them that they fixed prices because they sent out cards announcing their price, but the answer was that it was purely for advertising purposes. He further complains that coke follows the price of anthracite, although it is made from soft coal. The county attorney believes that the state law against trusts is available.

The Minnesota Securities Commission has revoked the license of the Louden Coal Mines Co., with an office in Minneapolis, to sell stock in the state. The company was licensed in April, 1920, to sell 2,000 shares of stock at \$50 a share. It is alleged that the company's salesmen have held out an offer to deliver coal at 50c. a ton over the wholesale price, although the company has no yards or facilities for the delivery of coal.

A vigorous campaign is being made against anthracite because of the high price in the Northwest. The Minneapolis Citizens' Alliance, an open-shop association, devotes a portion of its October bulletin to the story of the United Mine Workers, and the recent increase in anthracite, and urges the development of lignite and peat for fuel, in place of anthracite.

MISSOURI

The east side of the Walton coal mine at Higbee was closed down Oct. 1. A total of seventy-nine men were given enforced vacations, which included nineteen company men. There is no immediate prospect of the mine reopening.

Drillers in the big test oil well at Chillicothe passed through four strata of coal one day recently, making a total of 22 ft. passed through in the last 175 ft. of drilling. The various depths are as follows: At 360 ft., the first 6 ft. of bituminous coal; at 378 ft., the second vein of bituminous coal, 3 ft. thick; at 443 ft., a 7 ft. vein of semi-anthracite coal; at 524 ft., a 6 ft. vein of semi-anthracite coal. The geological survey indicates that the coal area in this field extends over 4,000 acres of land and a little over two miles in length.

The Busy Bee coal mine, at Huntsville, which has been idle for a long time, is to be opened after a turbulent time in the courts and elsewhere for the past three years. The plant was sold to Mitchell & Lovell, coal operators of Huntsville, who failed to put the mine in condition to operate because of the opposition of the local miners' union, who demanded that a debt of about \$3,600 for labor be paid. This was not done and the mine remained idle. Recently W. E. Mitchell purchased the interest of his partner, Al Lovell, in the mine and lease of coal. Mitchell subleased the mine to Walter Winkler and Sam Skaggs, experienced miners, and they will operate it on the co-operative plan and run it on the miners' scale. The mine is being cleaned and repaired and is expected to be in operation in 30 days.

The body of Ernest R. Sweeney, of the Gray-Bryan-Sweeney Coal Co., of Kansas City, was found in the Missouri River lodged in underbrush near the bank, not far from Randolph Oct. 16. Mr. Sweeney disappeared the morning of Aug. 30. His son a few days later found a note in his father's apartment to the effect that he intended to commit suicide. In it he said he was "tired of living." Mr. Sweeney's act is attributed to ill-health and to worry about his wife, who is in a sanitarium in Colorado.

COAL AGE

NEW YORK

The Central Railroad of New Jersey after several tests to reduce the time of transporting coal from the anthracite fields to New York City and points east and also to eliminate congestion at different points, has adopted a schedule whereby a train of coal is transported to Jersey City in practically half the time formerly required. Under the old system when a train left the anthracite fields it was taken to Mauch Chunk or Allentown, where it was sidetracked until another train crew could take it to its destination. This system usually consumed at least twenty-four hours before the coal reached Jersey City. Under the new system one of the new Mikado type engines is coupled to a train of cars at Penobscot averaging from seventy-one to seventy-six coal cars, with a tonnage of from 4,600 to 4,760 and transported through to Jersey City with a stop at Allentown of sufficient time to change the entire crew. The engine remains coupled to the train and makes the entire trip. According to a railroad official the trip is made in a little more than twelve hours. Returning trains averaging from 80 to 120 empty cars are brought back on the same plan as outgoing trains.

The Penn Fuel Co., New York City, in submitting a price of \$4.47 per ton was the lowest bidder in offering to furnish and deliver, alongside vessel New York harbor, 670 gross tons Pool 9 bituminous coal, to the United States Shipping Board. The bids were opened on Oct. 15 and the coal was delivered on Oct. 17. Other bidders were: H. B. W. Haff, \$5.10; Lee Coal Co., \$4.63; Imperial Coal Corporation, \$5.04; Rhodes Fuel Corporation, \$4.68; Seiler Coal Co., \$4.64, and Knickerbocker Fuel Co., \$5.25. On a net ton basis, f.o.b. mines, the prices submitted ranged from about \$1.27 to \$1.97.

R. W. Hopkins, chief fuel inspector for the United States Shipping Board, North Atlantic District, has gone to Europe for a few months for the purpose of investigating the fuel situation.

PENNSYLVANIA

The Philadelphia & Reading Coal & Iron Co. and the Lehigh Valley Coal Co. have announced a 10 per cent increase in wages to their monthly men, including mine foremen, assistants, firebosses and clerks. The new wage date is Oct. 1.

A. S. Wilson of Southmont, Johnstown, has been appointed general manager of the Eastern division of the mines of the Cosgrove-Meehan Coal Corporation in western Pennsylvania, according to an announcement by H. J. Meehan, president of the corporation. He has been connected with the Cosgrove organization for some years and has been actively engaged in their mining work in both the Western and Eastern divisions. Mr. Wilson has assumed charge of new duties and occupies offices in the Swank Building in Johnstown.

Nine hundred men at the Central colliery of the Pennsylvania Coal Co. at Pittston went on strike Oct. 18 because the boss fireman at the mine refused to join the union. At the Wright Slope No. 6 mine of the same company, also at Pittston, 150 employees struck because a driver boy, who was employed in Detroit during the recent suspension of mining activities was not given his place on his return.

A permanent organization of The Coal Consumers' Association of Philadelphia was effected on Oct. 9. The primary purpose of the association is to bring about a reduction in the cost of anthracite. It has communicated with President Coolidge and Governor Pinchot. A committee has under preparation a schedule of fair prices.

A new corporation, known as the Chase's Mills Coal Mining Co. has been organized to operate the Chase Mills mine, Tioga County. Officers and directors include Dr. C. N. Bradford, Floyd Crist, Alfred Collins, and Robert Krise, all of Canton. The mine is six miles from Canton. Considerable improvement work was started at the mine.

Officials of District 7, United Mine Workers of America, in an official notice sent to all local unions of the district call for Monday, Oct. 29th, being observed as Mitchell Day. The miners are directed to remain away from work that day. The official call in conclusion makes the following statement: "In the observance of Mitchell Day this year we are reminded that the organization has just achieved one of the greatest victories in the history of the anthracite region and this victory was made possible as a result of united organized co-operating effort and we should reserve in the declaration of Mitchell Day this year to do all in our power to maintain our forces to the highest degree of usefulness to the end that in the future we

may continue to write progress into the history of the United Mine Workers of America."

The following plants in the Connellsburg coke region have recently closed down: Waltersburg Coke Co., one plant of the Westmoreland-Fayette Coal & Coke Co. and some of the plants of the Consolidated Coke Co., the two latter being in the Pt. Marion-Masontown section. The Pittsburgh & Erie Coal Co., Brazzle mine, on the edge of the coke region a couple miles from Brownsville, which had been working steady till last week, is now running on time. The Lilley Coal & Coke Co., following the strike, recently reported, has decided not to make any attempt to start up in the near future, owing to the dull condition of the coal market. This is a union mine near West Brownsville, in Washington County, and on the Monongahela River.

Just when Governor Pinchot will be ready to call a conference of the Governors of anthracite-using states he is not yet ready to say. Prior to leaving the Capitol at Harrisburg for the annual conference of all the Governors at West Baden, Ind., he said he has not yet all the data on the coal situation in Pennsylvania he desires. The Governor suggested the conference to discuss means of keeping down the retail price of coal.

Stockholders of the Reading Co. at a special meeting on Oct. 15 held at Philadelphia, authorized the officers to carry into effect the third modified plan decreed by the United States District Court, to segregate the various properties controlled by the company. Authorization also was voted to increase the indebtedness of the company to the extent of \$64,000,000, the creation of a mortgage and deed of trust to secure the issue of bonds, to merge various subsidiaries, and to dispose of the Reading Iron Co., and the Philadelphia & Reading Coal & Iron Co., in accordance with the segregation plan.

Attorneys for 123 coal companies claim that they have reduced tax assessments of County Schuylkill lands \$100,000,000. The reduction is an agreement between the attorneys for the coal companies and the county attorneys that the ratio of real estate assessment is 45 per cent of the full value and not 60 per cent, as heretofore claimed by the county commissioners. As the coal lands cannot be assessed at a higher ratio of value than other real estate, it is apparent that a big reduction has been made. Although attorneys for the county say the reduction is not more than \$45,000,000, even with that the total assessment is now \$375,000,000, having been increased to that point from \$69,000,000, the last previous assessment. Corporation attorneys say the assessment has been decreased from \$420,000,000 to \$320,000,000. The agreement does not halt the hearing, as the most important issue, whether the coal lands have been assessed at market values, is to be determined. The county commissioners deny that any great victory has been won by the corporations and say they have been willing all along to lower their assessment to arrive at a settlement.

Shipments of anthracite during September, 1923, as reported to the Anthracite Bureau of Information, Philadelphia, amounted to 2,194,940 gross tons. Operation was resumed on Sept. 19 and during the ten working days to the end of the month there was a daily average shipment of 219,490 gross tons. This daily average could have been materially increased had the collieries resumed full operation on Sept. 19. Some, because of an insufficient force of men, did not resume operation until a later date. The average daily shipment during the preceding month of August was 247,105 tons. Shipments by originating carriers were as follows:

	September 1923	August 1923
Phila. & Reading.....	420,859	1,277,770
Lehigh Valley.....	372,997	1,154,004
Jersey Central.....	154,200	496,725
Del. Lack. & Western.....	318,182	1,004,507
Delaware & Hudson.....	298,775	943,143
Pennsylvania.....	196,839	555,064
Erie.....	251,277	759,711
N. Y., Ont. & Western.....	61,229	154,586
Lehigh & New Eng.....	120,582	327,345
Totals	2,194,940	6,672,855

Solution of the recurring coal disputes lies in the direction of better organization in the industry and the working out of an agreement between the coal operators and the mine workers by which the responsibility for establishing and maintaining peace in the industry is recognized and placed upon permanent committees made up of representatives of operators and miners, according to Dr. Royal Meeker, State Superintendent of Labor and Industry. "Public ownership or operation of the mines offers no hope of a

solution in the near future," he said, "because neither the public nor the mine owners are ready for this step. The business of digging, transporting and marketing coal is a very complicated one, and it would require many years to educate the public, the mine owners and mine workers for such an enterprise and to build up a public agency which could conduct this business efficiently, even if it were possible to divorce it from the curse of political appointments and political pressure. Eventually, it is probable, we will come to public ownership and operation, but what is needed is stabilization of the coal industry during the period of education and training perquisite to the successful operating of the coal industry by the public."

WEST VIRGINIA

With the end of the first week of October a total of 1,518,000 tons of coal had been consigned from northern West Virginia points to the lakes and it is now estimated that if the average prevailing during the season is maintained the total will reach 1,900,000 tons before the end of the lake period for navigation. Not less than 30,000 cars of coal have been shipped from mines on the Monongah Division of the Baltimore & Ohio and from mines on the Charleston division of the same road even so far this season. There have been shipped from Scotts Run territory about 4,777 cars. Virtually twice as much tonnage has been shipped to lake piers as during any other recent lake season.

A special committee has been delegated by the Kiwanis Club of Beckley to urge the commission recently appointed by Governor E. F. Morgan of West Virginia to select Beckley as the proper place for the location of the recently created School of Mines of West Virginia. The committee is composed of E. L. Ellison, J. Q. Hutchinson and the Rev. W. R. Lloyd. Although replies to communications addressed to the members of the commission have been of a non-committal nature the promise has been held out that Beckley would be considered in connection with the selection of a site.

Millions of dollars collected by the United States Government on the payment of taxes from royalties on coal leases executed prior to March 1, 1913, may have to be refunded as the result of the suit of the Thacker-Pocahontas Coal Co. of Welch, against Albert B. White, collector of internal revenue for West Virginia. This company asks the refund of \$6,000 paid in income tax on royalties received. The case was argued at Huntington in the U. S. District Court for the southern district of West Virginia before Judge George W. McClintic. It is planned by each side to carry the case to the U. S. Supreme Court in the event of an adverse decision in the court below. The coal lease involved in the suit was executed by the Thacker-Pocahontas company in 1901. The argument advanced by the company is that the lease really constituted "a sale of the coal in place" and that it was made prior to March 1, 1913, when the income tax law became effective and that the royalties received are deferred payment for the coal sold under the lease, and if that be true the royalties received are not taxable. Representatives of the government contend that the lease is in the same form which is in general use and does not constitute a sale. It also is asserted by the plaintiff company that if it be held that the royalties received are not to be considered as deferred payments, then enough has not been allowed for the depletion the mining of coal involves.

Coal-loading records for any six-day period in the history of the Chesapeake & Ohio R.R. were exceeded during the week ending Oct. 13, when 17,605 cars were loaded and moved from the Logan, New River, Kanawha and Kentucky fields. The previous record was 17,489 cars during the week of Sept. 29.

The records of the West Virginia Compensation Commission go to show that there is not as much hazard to the coal industry in West Virginia as there is in connection with other industries; the hazard about which so much is heard seems to be more imagination than fact. In short though 60 per cent of the wage earners of the state are connected with the coal industry yet that industry has only 40 per cent of the accidents in the state. Of course the records of the Compensation Commission, being official, effectively dispose of the fiction that there is more danger attendant upon the occupation of mining than in any other occupation. It also is shown by the records that out of the 40 per cent of injuries reported, those peculiar to the mining of coal constitute a still smaller percentage of the whole. The fact that the hazard involved in the mining of coal has been reduced in West Virginia is due partly to drastic laws on the subject and to the education of

miners in safety methods and first aid work under the supervision of the West Virginia Department of Mines which is constantly striving to reduce the hazards.

Four of the six mines of the Cannelton Coal Co. near Montgomery, have been forced to close down due to the dormant demand. The mines just closed are among the largest mines operating on the Kanawha & Michigan.

The White Oak mine, on Jumping Branch in Summers County, is undergoing development and a small tonnage of coal has been produced at this mine recently.

There is a possibility that development of coal underlying the lands of the New River Coal & Land Co. opposite Hinton will be undertaken in the near future. At least plans are being made with that end in view.

Charles C. Dickinson, president of the Dry Branch Fuel Co., was seriously injured in Charleston, Oct. 18 when he was struck by an automobile. The machine struck him as he was crossing the street. His left arm was broken just below the shoulder. In addition he suffered the fracture of both bones in the left forearm. He is cared for at the Kanawha Valley Hospital.

At a special receiver's sale the operation of the Fort Defiance Coal Co. near Kanawha Falls, in the Fayette County field, was sold to **Eben M. Martin**, the purchaser obtaining the property for the sum of \$2,602. It was necessary, however, for the purchaser to assume the payment of delinquent royalties, which will reach a total of \$5,000.

Edgar Combs placed on trial in Logan County Oct. 15, charged with having participated in the armed march of 1921 against Logan and more directly with having fired the shot which killed Deputy Sheriff John Gore, of Logan, entered a plea of guilty Oct. 17 after the court had denied a request for a change of venue and after C. J. Van Fleet, who has been counsel for the union miners in all the other cases growing out of the armed march, had retired from the case. Two days were consumed in arguing on a motion made by Van Fleet for a change of venue, his plea being that Combs could not obtain a fair trial. Affidavits were submitted by the prosecution to show that Combs could and would receive a fair trial. It also was pointed out by counsel for the state that in every instance where there had been a change of venue, by propaganda and otherwise the union had sought to influence jurors in advance. When Combs indicated to his attorney that he desired to plead guilty, Van Fleet withdrew. The plea of guilty was made with the understanding that a life sentence instead of the death penalty would be concurred in by the prosecution. As soon as Combs had made his plea the court imposed the life sentence upon him.

WASHINGTON, D. C.

During September the Geological Survey made reports on 23 applications for coal prospecting permits and 23 applications for coal leases, under the Leasing Act of Feb. 25, 1920. Since the passage of the leasing law a total of 1,153 applications for coal permits and 411 applications for coal leases have been reported on by the Survey.

C. Lorimer Colburn, of the U. S. Bureau of Mines has succeeded E. H. Denny as secretary of the Joseph A. Holmes Safety Association. Chapters of the association were recently instituted at West Terre Haute, Ind.; Barton, Ohio; Rayland, Ohio; Staunton, Ill.; and New Philadelphia, Ohio.

The Interstate Fuel Co. and the White Ash Coal Co., both of St. Louis, Mo., are named as respondents in a complaint issued by the Federal Trade Commission. The concerns are engaged in the business of buying and selling coal in wholesale and retail quantities, and are charged with the use of the words "Mt. Olive," "Mt. Olive Grade," and "Guaranteed Mt. Olive Coal" in connection with coal from districts other than the Mt. Olive district, sold by respondents in competition with coal mined at Mt. Olive, Ill. The Commission alleges that respondents' coal sold under such names is not the product of the Mt. Olive mine or of the district understood by a substantial part of the purchasing public as the Mt. Olive district. It is also alleged that the company's acts are unfair to competitors who actually deal in Mt. Olive coal.

Argument has been heard in the U. S. Supreme Court in the case of the **Matthew Addy Co.**, coal dealers of Cincinnati, charged with violating the Lever fuel-control law by selling coal at a margin of 25c. per ton as against a margin of 15c. established by the government during the war.

CANADA

The provisional officers of the United Mine Workers of District 26, have sent a communication to the Dominion Coal Co. asking that a date be set for a conference to discuss a new wage contract, and suggesting Tuesday, Nov. 20, as a date suitable for the first meeting. If this is not agreeable, any other day could be mutually arranged. The present working contract between the miners and operators expires on Jan. 15 and under the agreement it is necessary that if either party to the agreement desires a change, they must give 45 days notice in writing of such desirability. It was said that the miners will demand a restoration of the 1921 rates, and some readjustments in several classes. Phalen local at No. 2 is the first of the U.M.W. locals to take a stand on what they want in a new contract. They have passed a resolution, that is being forwarded to all other locals in the district, asking for a 40 per cent increase over the present rates, which is equivalent to 20 per cent over the 1921 rates.

The eighth annual field day of mine-rescue and first aid competitions of the Vancouver Island Mine Safety Association was held at Ladysmith, B. C., on Sept. 3. There were nine entries for the mine rescue event for the V.I.M.S.A. shield and individual prizes. After a close struggle the shield was won by No. 7 team, Captain Williams, of Cumberland, with 93.2 per cent; second place by No. 3 team, Coal Creek, Captain Caulfield, with 93 per cent, and third place by No. 5 team, Captain Broderick, Nanaimo, with 89.4 per cent. In the first-aid events the British Columbia Mines Department Cup was won by Nanaimo, Captain Barton's team; Captain Beveridge's team, Cumberland, being second. There were eight entries. The W. L. Coulson Cup was won by Captain Beveridge's team, Cumberland, with Captain Delaney's team, of Ladysmith, second. There were eight entries. For the one-man event there were nine entries, and J. Thompson and J. Scott (patient), of Nanaimo, took first place, and H. M. Yeowat and A. Inay (patient) second. In the two-man event J. B. Stewart's team, of Cassidy (Granby Consolidated L. & P. Co.), was first, and Thorpe's team, of Nanaimo second. The V.I.M.S.A. Junior Challenge Cup was won by Captain Wharton's team, Nanaimo, with Captain Wilson's team of Ladysmith, second. The V.I.M.S.A. Ladies' Challenge Cup was won by Mrs. Henderson's team, of Cumberland. Second place was won by Mrs. Delaney's team, of Ladysmith, and Mrs. Rutherford's team, of Nanaimo, won third.

Ross C. Wheatley, of Hamilton, Ont., has been appointed Canadian representative of the Maher Collieries Co., of Cleveland, Ohio, which will open offices in Hamilton about the beginning of 1924.

Dan Livingstone, James B. McLachlan and others of the deposed United Mine Workers' executives in District No. 26 had their legal status restored on Oct. 9, when Justice D. D. McKenzie, in the Supreme Court, at Sydney, N. S., granted an order discharging and vacating the restraining order Silby Barrett, provisional president, obtained from Justice Chisholm in Halifax July 23. This restraining order prevented Livingstone, McLachlan and the various district board members, from functioning as U.M.W. executives and also prohibited them using certain moneys, then on deposit in the banks to the credit of the U.M.W. in District 26. N. R. McArthur, solicitor for Barrett and President John L. Lewis, announced that he had filed a discontinuance of the order and would not take the action to trial as proposed.

MEXICO

Alexander V. Dye, of New York City, an experienced mining man, has been appointed commercial attaché of the Department of Commerce at Mexico City, it has been announced by Secretary Hoover. Mr. Dye is a native of Flora, Ill., and a graduate of Williams Jewell College and of the University of Leipzig. He is intimately acquainted with Mexican economic conditions, having served as United States Consul at Nogales from 1909 to 1913. Mr. Dye served as assistant general manager of the Phelps Dodge Mining Co. of Arizona several years. During the war he was war trade representative at Christiania, Norway, and was European representative of the American International Corporation 1919-21. In September, 1921, he was appointed a trade commissioner of the Department of Commerce and assigned to the American Embassy at London. He sailed from London Oct. 17 and after conferring with the Department of Commerce officials in Washington will proceed to his new station at Mexico City.

Obituary

Byron F. Hobart, 76, once president of the Kansas & Texas Co., died Oct. 3 in San Diego, Cal. Mr. Hobart had lived in San Diego since 1914. He long ago sold his coal interests to Richard Keith of Kansas City. He retained large properties in Missouri and was president of the Union Iron Works, of Springfield, Mo. He was the first president of the San Pedro, Los Angeles & Salt Lake Railroad Co., but retired from all business activities when he went to San Diego.

Frederick Rheinfrank, 62 years old, senior vice-president of the Stokes Coal Co., New York City, died Oct. 15 after an illness of several months. He was born in New York City and had spent most of his life in the coal business. He formerly was head of the J. Rheinfrank Company, which was absorbed by the Stokes interests a few years ago. He was a member of the Uptown Club, the New York Athletic Club and several other organizations. He leaves his wife, Mrs. Mary Louise Rheinfrank.

Thomas Ward, 82, retired coal dealer, died Oct. 18 in his home, 596 West 152d Street, New York City. He was born in County Wexford, Ireland, and came to New York in 1866. After being on the police force for a short time he entered the employ of Townsend & Co., coal dealers, and in 1888 he purchased the business and conducted it as the Thomas Ward Coal Co. In 1908 the business was turned over to his sons, Joseph, William, Thomas and Walter, and he had since devoted his time to real estate operations, having acquired holdings in the Washington Heights section. Besides his wife and sons he leaves a daughter, Mrs. William J. Hammer. Funeral services were held at 10 A. M., Oct. 20, in the Church of St. Catherine of Genoa.

Profound regret was caused by the death at Fairmont, W. Va., on Saturday, Oct. 13, of **A. Brooks Fleming, Sr.**, one of the grand old men of the state, long a leader in its industrial, commercial and political life as well as a leader at the bar and at one time the Governor of West Virginia. At the time of his death former Governor Fleming was in his 84th year. Until within the last few years he had continued in the active practice of law and had also devoted much of his attention to the many mining properties in which he and members of his family were interested, having played an important part throughout his long and useful life in the coal development of northern West Virginia. He married Miss Caroline Margaret Watson, daughter of the late James O. Watson, a pioneer in the mining industry in northern West Virginia, with whom Governor Fleming was actively associated in the coal business. His wife is a sister of Colonel Clarence W. Watson, president of the Consolidation Coal Co. She survives him in addition to four children: Mrs. Charles E. Ward, of Charleston, W. Va.; Mrs. Charles B. Mitchell, of Fairmont; George W. Fleming, of New York, president of the Elkhorn Coal Corporation, and A. Brooks Fleming, Jr., who is assistant to the president of the Consolidation Coal Co. For many years Governor Fleming was counsel for that company and other large companies in northern West Virginia, and a director in the Consolidation company. The funeral was held at Fairmont Oct. 15th and was attended not only by many distinguished citizens of West Virginia but by many coal men from New York and other important coal centers.

Thomas Cunningham, county mine inspector of Madison County, Illinois, died recently at his home Edwardsville, Ill. The County Board of Supervisors has appointed a man under the emergency act to fill the place until Dec. 1 when the term of Cunningham would have expired, at which time a regular appointment will be made. The duties of the officer is to inspect reports of deaths, injuries and accidents at the mines.

Recent Patents

Flotation Machine. Thomas A. Janney, Garfield, Utah, 1,457,077. May 29, 1923. Filed Aug. 21, 1919; serial No. 318,958.

Lamp Holder for Miner's Cap. Eli Israel, Wilkes-Barre, Pa.; 1,466,300. Aug. 28, 1923. Filed Feb. 24, 1922; serial No. 538,983.

Method and Apparatus for Separating Coke and Ash. Philip H. Jung, Mount Union, Pa.; 1,466,377. Aug. 28, 1923. Filed Nov. 8, 1919; serial No. 336,689.

Electric Hoists. Detroit Hoist & Machine Co., Detroit, Mich. Catalog 23 E. Pp. 24; 6x8 in.; illustrated. Describes various special applications of hoists, monorails, cranes and winches.

Method of Burning Pulverized Fuel. Henry Kreislinger, Pittsburgh, Pa., assignor to Combustion Engineering Corp., New York; 1,463,283. July 31, 1923. Filed Oct. 22, 1920; serial No. 418,640.

Reciprocating Screen or Conveyor. Richard S. Jacobsen, Chicago, Ill., assignor to Webster Mfg. Co., Chicago, Ill.; 1,465,942. Aug. 28, 1923. Filed May 26, 1921; serial No. 472,772.

Coke-Oven Door. Arthur Roberts, Evanston, Ill., assignor to Chicago Trust Co., Chicago, Ill.; 1,466,064. Aug. 28, 1923. Filed Oct. 31, 1919; serial No. 334,704.

Association Activities

Transportation problems were paramount at the regular monthly meeting of the Smokeless Coal Operators Association of West Virginia held in New York about the middle of the month. In calling the meeting to order President Robert H. Gross made feeling reference to the recent death of Kuper Hood. A committee consisting of T. F. Farrell, O. M. Deyerle, G. H. Caperon, W. P. Slaughter, George Daniels and T. S. Crockett was appointed to prepare suitable resolutions of respect covering the death of Mr. Hood. There was discussion of the position taken by coal operators north of the Ohio River that the coal fields of West Virginia are "children born before their time" and of the activities of operators in the Pittsburgh district in filing their petition before the Interstate Commerce Commission asking that the freight rates on coal to the lakes and Northwest be still further widened, all of which were considered as being of vital importance to the coal industry of the entire state.

Traffic News

The railroads during the month of September placed in service 18,519 new freight cars, together with 380 new locomotives, according to the Car Service Division of the American Railway Association. This brought the total number of new freight cars installed from Jan. 1 this year to Oct. 1 up to 134,636, while the number of new locomotives installed during the same period totaled 2,963. The railroads on Oct. 1 also had on order 64,601 new freight cars, with deliveries being made daily. They also had 1,242 new locomotives on order. Of the new freight cars installed during September, 8,916 were coal cars, which brought the total number of cars for that class of equipment installed during the first nine months this year up to 55,575.

According to information the October report of the D. L. & W. Ry. should show the highest car loadings for the current year. For the first thirteen days of this month loadings of anthracite on Lackawanna's lines amounted to 415,690 tons, as compared with 389,410 tons for the same period last year. Bad order cars as of Oct. 12 amounted to 3.68 per cent of the total on line, while locomotives out of commission represented 16.16 per cent of the total on line.

W. J. Manley has resigned as traffic manager of the Logan Coal Operators' Association after three years' service with headquarters in Washington, to take a position in the traffic department of the Pittsburgh & West Virginia Ry. and West Side Belt R.R. at Pittsburgh.

Complaint has been filed with the Interstate Commerce Commission by Smith & Duckworth and Joseph Dinford & Son, against the C. C. C. & St. L. and others, alleging violation of the Transportation Act in the rate of \$1.40 a net ton charged on bituminous coal from points in the Clinton and Brazil districts of Indiana to Crawfordsville, Ind., and other Indiana districts via interstate routes. Nine similar complaints were filed by other consignees, alleging unjust discrimination with respect to Indiana rates.

The Car Service Division of the American Railway Association announces that the locomotive equipment of the railroads of the United States is now in the best condition it has been in years. The railroads of this country on Oct. 1 had 9,823 locomotives, or 15.3 per cent of the total number on line, in need of repair. This is the smallest number in need of repair

for any period since the Car Service Division began the compilation of these records in August, 1920. This also is a decrease of 969 locomotives compared with the number in need of repair on Sept. 15, at which time there were 10,792, or 16.8 per cent. The railroads on Oct. 1 had 54,159 serviceable locomotives, an increase of 892 compared with the number serviceable on Sept. 15. They also had on Oct. 1, 2,620 locomotives in good repair but in storage.

Suggestion that freight rates on anthracite to Canada be the same as those to northern New York and New England has been made by President Coolidge to President Rea of the Pennsylvania R.R. It is said that the fact that coal is shipped to Canada at lower freight rates than for domestic consumption in the United States is a source of complaint in New England.

The Interstate Commerce Commission has given notice that the case of the Northwestern Coal Dock Operators' Association vs. the Chicago & Alton R.R., Docket 14476, has been assigned for hearing and before the full commission, Nov. 15, 1923, at 10:30 a.m., in Washington. This case also includes Docket 14533. Traffic Bureau of the Sioux City Chamber of Commerce vs. the Baltimore & Ohio R.R.; Docket 14622. Board of Railroad Commissioners of the State of South Dakota vs. the Chicago & Alton R.R.; Docket 14142. Illinois Coal Traffic Bureau vs. the Chicago & Northwestern Ry., and Docket 14477. C. Reiss Coal Co. vs. Ahnapee & Western Ry. Among other matters, the case involves dock rates on coal vs. all-rail rates.

Freight traffic during the first eight months this year was the heaviest in the history of the United States, according to reports by the Bureau of Railway Economics, amounting to 304,267,000,000 net ton miles. This was an increase of 3.6 per cent over the corresponding period in 1920, which marked the previous record and 5.5 per cent greater than the first eight months in 1918, when freight traffic was greatly stimulated by the war. Compared with the first eight months last year, when freight traffic was reduced somewhat not only by the strike of coal miners but also by that of the railway shopmen, freight business from Jan. 1 to Sept. 1 this year was an increase of 33.5 per cent. The average load per car in August was 28.5 tons, the same as in July. This is the highest average for any August since the compilation of these records was started in 1917, except in 1918, when the average was 30.1 tons and August, 1920, when it was 29.8 tons. The average daily movement per freight car during August was 28.2 miles, which was an increase of two-fifths of a mile over that for July this year and the highest for any August since the compilation of these records began, exceeding by four-fifths of a mile the average for August, 1920, and by 2.5 miles the average for August, 1918.

The receiver of the Denver & Rio Grande Western R.R. has asked the Interstate Commerce Commission for permission to acquire the line of the Alamo Coal Co. connecting its mine at Alamo, Colo., with the applicant lines at Kebler, in Huerfano County, Colo. The coal road is 4.18 miles in length and in addition has tipple, passing and storage tracks approximating 1.65 miles in length. The consideration is to be \$80,000. It is stated to be uneconomical for the coal company to equip and operate this trackage, which would put it at a disadvantage in competing with other coal mines in the Walsenburg district.

Freight cars in need of repair on Oct. 1 totaled 151,332, or 6.7 per cent of the number on line, according to a report by the Car Service Division of the American Railway Association. This is a decrease of 13,952 under the number in need of repair on Sept. 15, at which time there were 165,284, or 7.3 per cent. Freight cars in need of heavy repair totaled 118,563 or 5.3 per cent of the number on line, which was a decrease of 11,549 compared with the number on Sept. 15. Reports showed 32,769, or 1.4 per cent, in need of light repair, a decrease of 2,403 within approximately 15 days. This is the best condition of railway freight cars that has existed on the American railroads for years.

Coming Meetings

Harlan County Coal Operators' Association. Nov. 21, Harlan, Ky. Secretary, E. R. Clayton, Harlan, Ky.

Coal Mining Institute of America will hold its annual meeting Dec. 19, 20 and 21 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Chamber of Commerce Building, Pittsburgh, Pa.